

WORKSHOP
BEFORE THE
CALIFORNIA ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:)
)
Business and Industry Global)
Climate Change Strategies)
Workshop)
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HEARING ROOM A
CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CALIFORNIA

WEDNESDAY, DECEMBER 8, 1999

9:00 a.m.

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PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

COMMISSIONERS PRESENT

William Keese, Chairman

STAFF PRESENT

Kent Smith, Acting Executive Director

Nancy Deller, Deputy Director, Technology
Development

ALSO PRESENT

Jim Boyd, Resources Agency

Michael J. McAdams, BP Amoco

Judith Ann Bayer, United Technologies Corporation

Don Cunningham, Los Angeles Department of Water
and Power

Ravi Kuchibhotla, IBM

James C. Callaghan, Qualcomm

Clay Hinkle, BF Goodrich Aerostructures

David Hermance, Toyota Motor Company

Patrick Healy, Fetzer Vineyards

Judy Pike, Bentley Mills/Interface

Jerry Schoening, Applied Materials, Inc.

H. I. Bud Beebe, Sacramento Municipal Utility
District

Michael Burnett, Oregon Climate Trust

Sally Ericsson, Pew Center on Global Climate
Change

Jim Cathcart, Oregon Department of Forestry

Eric Heitz, The Energy Foundation

ALSO PRESENT

Arthur H. Rosenfeld, Center for Energy and Climate
Solutions

Donald W. Aitken, Union of Concerned Scientists

Steven D. Mazor, Automobile Club of Southern
California

Lisa Wood, City of San Diego

David Olsen, CEO Coalition to Advance Sustainable
Technology

Robert Wilkinson, Rocky Mountain Institute,
University of California Santa Barbara

Catherine R. Leining, Center for Clean Air Policy

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1 P R O C E E D I N G S

2 9:00 a.m.

3 MR. SMITH: Welcome to the CEC Staff
4 workshop on business and industry global climate
5 change strategies.

6 My name is Kent Smith. I'm the Acting
7 Executive Director of the Commission. This is the
8 second of a series of workshops on global climate
9 change that the Commission Staff has sponsored.
10 The first dealt with science fundamentals; this
11 with the response of industry and nonprofit and
12 some government agencies. And the third will be
13 dealing with California policy options.

14 Our purpose is to inform ourselves and
15 state policy makers of strategies to reduce
16 greenhouse gases, and with an emphasis on those
17 that have other environmental and economic
18 benefits.

19 I want to also welcome our listeners on
20 the internet. We'll keep you advised of any
21 schedule changes. The agenda is posted on our
22 website, as well.

23 A couple of housekeeping announcements
24 for those of us here at the Energy Commission's
25 hearing room. If you're not familiar with the

1 building, there are restrooms outside the door as
2 you came in and to the left. And then another set
3 of restrooms behind the staircase to the right.

4 We'll break for lunch at about 11:30,
5 quarter to 12. Have a little bit over an hour for
6 lunch and then come back in for the afternoon
7 session.

8 Our Public Adviser for the Energy
9 Commission is going to be available today. And if
10 there are any members of the public who wish to
11 make brief comments, there will be an opportunity
12 at the end of our presentations today, and at the
13 end of the panel discussion this afternoon for
14 those comments.

15 We do have a very full agenda, so I'll
16 ask the speakers to be mindful of the time for the
17 presentations and I'll help out as needed with the
18 timing.

19 The first section will begin in just a
20 few moments, but the first thing I wanted to do is
21 to introduce the Chairman of the California Energy
22 Commission, Bill Keese.

23 CHAIRMAN KEESE: Thank you. We're
24 testing out our new hearing room, so this is the
25 first time moving over to this site, and we'll see

1 how this works.

2 It's my pleasure to be here, and I mean
3 that sincerely. I am just thrilled that we were
4 able to put together a panel like this and take
5 this step forward in our process.

6 As many of you are probably aware we had
7 a scientific panel a number of months ago that set
8 the basis, we believe, for the science in this
9 area.

10 This is step two, and what we are
11 looking for is to find out what business is doing,
12 particularly those businesses that are being
13 innovative, are doing in this very important area.

14 And our third step will be early next
15 year in setting a strategy for California to
16 follow.

17 An in my mind, in this situation,
18 business has led the way. Business has showed us
19 a path and that's what we hope to hear today, so
20 that we can recommend to the State of California
21 replicating this process.

22 I'd like to mention just a couple of
23 things at the outset. Senator Byron Sher, who has
24 been a champion of this area of air quality, of
25 responsiveness, of keeping up with global climate

1 change, was not able to be here. His Deputy, Kip
2 Lipper, is joining us today. Senator Sher has
3 submitted a statement for the record supportive of
4 this effort.

5 Senator Sher held hearings about ten
6 days ago on the same issue. And will be anxiously
7 looking for our output so that he can incorporate
8 it into his plans for next year.

9 Mary Nichols was called to the
10 Governor's Office this morning, a forest issue,
11 and will not be able to join us. But her Energy
12 Advisor at Resources Agency, Jim Boyd, is joining
13 us, and will be conducting the introduction on
14 behalf of Mary.

15 With that, I just welcome you here. I'm
16 thankful you are here, look forward to your input,
17 and I hope we have a good expeditious day.

18 Mr. Boyd.

19 MR. BOYD: Well, good morning. Thank
20 you, Chairman Keese, for that introduction. As
21 the Chairman indicated, Mary Nichols was called to
22 the Governor's Office and I'm here to provide a
23 welcome to you, and excuse me if I refer to her
24 notes on occasion for that introduction.

25 On behalf of Governor Davis and, of

1 course, now on behalf of Secretary Nichols, I
2 would like to welcome you to this workshop. As
3 one who was recently in Bonn, Germany,
4 participating in the global climate change
5 negotiations and observing, I'm personally
6 delighted to be here today to hear what business
7 has to say, what industry has to say, both
8 nationally and in California, as to what is being
9 done to address the global climate change
10 concerns.

11 As many of you know, this workshop is
12 the second in what is going to be a series,
13 organized by the Energy Commission, with the
14 sponsorship of the Resources Agency, to explore
15 the issues relative to global climate change.

16 Our mutual goal is to encourage
17 discussions among the public policymakers at least
18 in this state, if not nationally, and all the
19 other stakeholders on these various issues, so
20 that we can move towards developing effective
21 global climate change policies for California. Or
22 as I like to refer to it once in awhile, the
23 nation state of California.

24 The Energy Commission, I think, as you
25 know, is the leading state government agency in

1 addressing and assessing the impacts of climate
2 change, and they've been called upon to provide
3 information upon which to base appropriate state
4 policies, and I would like to thank the Commission
5 Staff for all the work they've done in the past,
6 for the work they've done on these workshops.

7 But I'd also like to thank the
8 California Air Resources Board, who has been a
9 regular supporter of these efforts, and who have
10 helped support these workshops and their
11 organization.

12 At our last workshop in early June we
13 met with ten of the nation's leading climate
14 change scientists to discuss the latest evidence
15 on climate change, and the complex issues
16 surrounding the subject. And for those of us
17 there it was a very rewarding experience.

18 We felt the next step after this should
19 be to hear from companies about innovative
20 policies and programs that they have already
21 adopted to reduce greenhouse gases and to respond
22 to the potential climate change issue.

23 Both government and the private sector
24 are becoming increasingly concerned about global
25 climate changes because of the potential severe

1 impacts, at least in this state, on our economy
2 and our environment that could result from these
3 predicted changes.

4 The fact that this issue is receiving
5 increasing attention in California was
6 demonstrated last month when many of our major
7 newspapers, The Los Angeles Times, The San
8 Francisco Chronicle, and The Bee, among a few,
9 carried articles all on the same day, the 4th of
10 November, on the release of the new report on the
11 probable effects on California of global climate
12 change.

13 This report, which was done by the Union
14 of Concerned Scientists and others, forecast
15 potentially increased and earlier winter rainfalls
16 resulting in reduced snow pack, potentially
17 causing water shortages in the spring, and more
18 runoff in our winters, adding to California's
19 flooding and landslide problems.

20 It also forecast warmer summers that
21 would intensify our droughts and our serious
22 wildfire problems.

23 As well as threatening California's
24 homes and businesses, the combined water cycle and
25 temperature changes could well pose public health

1 and safety problems, and also problems for plants
2 and animals, including many of California's
3 already endangered species.

4 The California Legislature, as has been
5 noted, is very interested in climate changes, at
6 least some members are. And as referenced on
7 November 16th, Secretary Nichols spoke at the
8 Senate Committee on Environmental Quality in Los
9 Angeles, which hearing was organized by Senator
10 Sher, to consider actions that business, industry,
11 environmental interest groups, state government
12 agencies and others are taking to respond to this
13 issue of global climate change.

14 Just kind of a personal note. Senator
15 Sher has long been a proponent of better informing
16 public policymakers, private sector interests and
17 the public on global climate change issues.
18 Frankly, his interest has provided strong support
19 and incentive to some of us, to many for
20 developing policy strategies for California to
21 adopt that could well reduce the potential severe
22 impacts of this accelerating climate change on our
23 state, while also working to enhance our economic
24 productivity.

25 Although there are still uncertainties

1 about the nature and timing of these climate
2 changes, both globally and locally, we should
3 consider current efforts to reduce greenhouse
4 gases as taking out an insurance policy against
5 foreseeing climate changes.

6 My feeling is that if we wait until all
7 of the uncertainties are addressed, it will be far
8 more costly then to address climate change impacts
9 than to take action now to help reduce them.

10 California's private sector has long
11 been a national leader in energy efficiency, the
12 use of renewable resources and reducing fossil
13 fuel use for electricity in vehicles, and in other
14 environmentally sound practices. And as one who
15 spent 20 years of my life with the California Air
16 Resources Board, I have an intimate knowledge of
17 that interest and that activity. And I've always
18 saluted California industry, which is probably why
19 sometimes I make reference to the nation state of
20 California.

21 Over the past two decades or more,
22 however, many businesses and industries have also
23 become concerned about predictions of the
24 potentially severe environmental and economic
25 impacts that may result from climate change caused

1 by excessive greenhouse gas emissions production.

2 Many companies have begun to focus on
3 measures that not only can continue to improve
4 their energy efficiency and improve their
5 bottomline, but also can reduce greenhouse gases
6 and respond to these potentially serious impacts.

7 I know all of us here in government
8 applaud these forward looking companies and hope
9 others will follow in their footsteps.

10 While many people assume that almost all
11 energy efficiency investments that are cost
12 effective have already been made, particularly in
13 states like California, many national and
14 international and California-based companies are
15 now discovering major new opportunities to
16 increase energy efficiency and reduce dependence
17 on fossil fuel.

18 And as just one who is spending a lot of
19 time in the energy arena now, I can say that there
20 are a host of reasons why we, in California, are
21 keenly interested in efficiencies and economies in
22 the energy arena at the present time. Not just
23 global warming. So, there's a real good
24 synergistic opportunity here to address some of
25 these issues.

1 Many of these opportunities have come
2 about as a result of technological breakthroughs,
3 and particularly better understandings of the
4 marketplace. These companies have also discovered
5 that the rate of return on their investment can be
6 substantial, that these strategies can, indeed,
7 increase profits, strengthen economic
8 competitiveness, and result in additional new,
9 more efficient practices, products and
10 technologies.

11 Today now we're going to hear from this
12 distinguished panel of companies and other who
13 have been in the forefront of exploring, inventing
14 and adopting strategies and have become extremely
15 knowledgeable in this field.

16 Nonprofit organizations such as the Pew
17 Center on Global Climate Change, the Energy
18 Foundation, also believe that the private sector
19 can substantially alter the course of climate
20 change impacts with strategies that have other
21 economic and environmental benefits. These
22 organizations are working closely with companies
23 from all major sectors nationally, and worldwide,
24 to demonstrate that belief, and I look forward to
25 hearing their experiences.

1 We're also going to hear from another
2 state that has taken substantial actions to reduce
3 greenhouse gases, and to respond to potential
4 climate effects. The Oregon Climate Trust
5 essentially developed from a grassroots movement
6 of concerned Oregon citizens, and has grown to
7 involve partnerships with the state's business
8 leaders, environmental interests and government
9 policymakers to reduce the state's greenhouse gas
10 emissions.

11 And I know personally that Oregon has
12 set CO2 emission standards for new gas-fired power
13 plants which can be met through developing a more
14 efficient plant, or by trading off emissions for
15 credits gleaned from reforestation or other
16 projects.

17 In the months ahead California
18 government will seek cooperation with the private
19 sector, with environmental interests, and other
20 stakeholders in building a strong consensus on
21 appropriate policies and strategies that could be
22 adopted to reduce the potential effects of climate
23 change on our state.

24 As one of the first steps in this
25 process we want to be better informed and updated

1 on what is already being undertaken by private
2 industry to respond to the local climate change
3 concerns. The issues are complex. We undoubtedly
4 need more than just the one day we have together
5 here to address them, but today is a good start, a
6 major milestone in continuing our information-
7 gathering and sharing efforts that will help us
8 work towards a consensus among all interested
9 parties on what we need to do here in the State of
10 California.

11 As I said before, today is an
12 opportunity for state government to listen, to
13 become better informed and educated, and to move
14 forward to support actions of our businesses, of
15 industry, of environmental interests, and other
16 stakeholders.

17 With a better understanding of the most
18 effective strategies that companies are adopting
19 to respond to global climate change concerns, in
20 cooperation with all stakeholders, I believe
21 public policymakers here in California can then
22 make the most appropriate decisions to address
23 these issues.

24 We have worked for many many years in
25 California to deal with the impacts of the state's

1 population growth, serious air- and water-quality
2 problems, as well as natural resource, habitat
3 protection, and a host of other issues.

4 Now we must expand our efforts to
5 include this new challenge to our environment, the
6 potential impacts of global warming changes. As I
7 said, we're very fortunate to have with us an
8 extremely distinguished group of business leaders
9 and other representatives. I know I speak for all
10 of my colleagues and the leadership of the state
11 in saying we look forward with extreme and great
12 interest to what it is you have to share with us
13 today. And I welcome you here, again. Thank you
14 very much.

15 (Applause.)

16 MR. SMITH: Well, this morning and just
17 after lunch we'll be hearing from California
18 national businesses and industries dealing with
19 the subjects that Jim Boyd has mentioned.

20 Then following that we'll have panel
21 discussions later in the afternoon.

22 I'd like to introduce our first speaker,
23 Michael McAdams. Mr. McAdams has been with BP
24 Amoco since 1988 and currently serves as policy
25 advisor to Sir John Brown. His career began on

1 Capitol Hill working for the Texas Congressional
2 Delegation. He's also worked as Field Coordinator
3 for President Carter in 1980.

4 As Staff to the Energy and Commerce
5 Committee, Mr. McAdams was involved in legislation
6 to decontrol natural gas, establish the Strategic
7 Petroleum Reserve, develop the Clean Air Act,
8 establish the Superfund and enact the Oil
9 Pollution Act.

10 Mr. McAdams will tell us of the process
11 that BP Amoco has used to develop their current
12 policies on climate change and the operational
13 experience of the company in responding to climate
14 changes.

15 Mr. McAdams.

16 MR. McADAMS: Thank you very much.

17 First let me thank the California Energy
18 Commission, Mr. Chairman and Distinguished Guests,
19 and Panelists for allowing BP Amoco the
20 opportunity to present with you today.

21 We're very excited about the journey
22 that we've taken since May 19, 1997, and we're
23 very excited to share with you today our progress,
24 because our journey began here in the State of
25 California at Stanford University with Sir John's

1 speech.

2 I thought it would be most helpful given
3 the context of today's discussions to take you
4 through the process, how we came about making
5 these decisions initially, share with you the
6 elements of our process, some of the experiences
7 we've had, and then close with a couple of
8 anecdotes. And I will try to do that in an
9 expeditious fashion.

10 First of all, we had what we refer to as
11 a top-down process. The board of directors became
12 very interested in the topic of climate change as
13 far back as 1995 and 1996.

14 We solicited from many respected
15 scientists from around the world to make
16 presentations to the board of directors. The
17 board of directors heard those presentations.

18 We then went out and submitted for some
19 public opinion research and we found that many of
20 the customers that we served around the world, and
21 we market in over 70 countries around the world,
22 believed, our customers believed that there was an
23 issue here that couldn't wait to be addressed, and
24 therefore they were looking for socially
25 responsible companies, pardon the phrase, to step

1 up to the plate and to try to take some meaningful
2 actions now rather than wait.

3 In accordance with that, we tried to
4 take some actions that we thought we could learn a
5 great deal from, and we thought the crucial
6 element of anything we did was to try to build the
7 credibility in whatever we said and however we
8 took those actions.

9 We identified a series of stakeholders,
10 just like you have here today, with respect to
11 being a government, a series of stakeholders which
12 we engaged with in individual meetings from all
13 around the world in different forms, to try to
14 come to an understanding of what they thought the
15 real underpinnings of this issue would be, and
16 what they thought the real activities a company
17 such as BP Amoco could take.

18 We landed on what I call the four
19 corners, and what we would do as the BP Amoco
20 portfolio approach. Our portfolio approach
21 identified what I like to refer to as today,
22 tomorrow and the future.

23 It identified things that we could
24 specifically do today, and before we could, just
25 as the State of California has recently completed,

1 we felt we needed to understand where we were
2 coming from, so we obviously needed to understand
3 what we had done in the past. Which meant we
4 needed to do a complete overall assessment of what
5 our emissions were in all of our facilities around
6 the world.

7 As you can imagine, when we recently got
8 to join partners with Amoco and become BP Amoco,
9 we also had to extend that effort into those new
10 facilities. We now have 135 what we call business
11 units around the world, and we've rolled up all
12 those emissions reductions efforts together so we
13 have a complete manifest, just like the State of
14 California does, with respect to our overall
15 emissions.

16 We also thought, going back to the
17 credibility piece, and we were told quite candidly
18 by some of our friends in the environmental
19 community, that if we did it by ourselves and we
20 reported our own numbers that there would be a
21 credibility gap. And they thought it was in the
22 best interests for BP Amoco and in the best
23 interests of the numbers we put on the street, for
24 us to find some independent transparency process
25 which we have embarked on, so that all of our

1 numbers are pre-audited with outside independent
2 organizations.

3 And then we have a partnership with the
4 Environmental Defense Fund where they are a
5 transparency mechanism for us in terms of the
6 actual emissions we have and the actual reductions
7 we garner.

8 As you can see, we also thought that in
9 terms of looking at the energy mix in the future
10 and becoming an energy company in the 21st
11 century, we needed to try to develop technology.
12 Some of that technology we had in-house, which was
13 solar technology. Since the Amoco transaction
14 we've actually expanded that, so we're now
15 actually the largest solar company in the world.
16 And we've made a pledge to grow our solar business
17 from a \$100 million business in 1997 when we did
18 the speech, to \$1 billion business in a ten-year
19 timeframe.

20 Basically the industry is a billion
21 dollar industry, so that would be having our
22 company be the size of the world industry right
23 now. So it's quite a high bar we've set for
24 ourselves and our people are actively engaged in
25 trying to fulfill it.

1 On the scientific research we've entered
2 into some partnerships with General Motors and
3 other international auto companies and other
4 international technology companies to try to go
5 through the whole portfolio and whole range of
6 different activities that we conduct, both in the
7 production side of gasoline, the pipeline side,
8 the production side of crude oil, to look at the
9 range of technologies we use in those different
10 applications and see if we can't apply new
11 technology or better ways to the technology we
12 have, to create energy efficiencies. And frankly,
13 to create opportunities for CO2 injection or other
14 CO2 solution strategies.

15 And then coming back to today, we looked
16 at the range of opportunities around the world.
17 At the time it was joint implementation, and
18 currently it's CDM, of where we could actually put
19 our money where our mouth was, and so we partnered
20 with a range of companies, some in the Northwest,
21 Pacific Northwest, PacifiCorp, American Electric
22 Power and the Nature Conservancy, to do a Noel
23 Kempf forest project in Bolivia.

24 That gives you the basis of the elements
25 in the policy, and I'm going to try to go through

1 that in a little more specificity.

2 Again, on the public policy side we
3 thought all these debates would be continuing to
4 on-go. We have what we like to refer to in BP as
5 a constructive engagement policy with the
6 governments around the world we work with. And we
7 have found in our dealings with governments that
8 one of the most powerful combinations we can put
9 together as a business is to actually go in with
10 partners.

11 And that partnership is a new paradigm
12 way to borrow a cliché phrase of really actually
13 landing some meaningful dialogues with how
14 different companies and how different countries
15 are trying to approach these strategies.

16 And we've done so with World Resources
17 Institute where we partnered with General Motors,
18 Monsanto and the safe clean business -- the MIT
19 program for climate change research and the others
20 you see listed.

21 All of these we have used to learn about
22 what others are doing to use their processes so
23 that we might apply them to our processes in what
24 we call a learn-by-doing process, which is a
25 cultural revolution we're trying to lead within

1 our own company.

2 We had to have a work plan, and so after
3 the speech in Stanford we developed a work plan
4 and this was the 1999 work plan. As you can see,
5 each of these independent pieces were all laid out
6 with timelines. We put real data and employee
7 resources on these to deliver these issues.

8 And, again, this partnership we created
9 with respect to the transparency process helped us
10 roll up, account, verify and report our successes
11 through our workplan.

12 I thought it would be interesting just
13 for a moment to show you in a company like ours
14 when we did the work, here, where our emissions
15 came from, on the downstream side. And when we
16 refer to downstream, that's everything after the
17 production side of the field, exploration and
18 production side of the field and the chemicals.

19 So when you look at downstream you're
20 looking at filling stations and refineries and
21 pipelines and ships and trucks.

22 On a scientific research box in our
23 plan, we copartnered with the Battelle Institute
24 and EPRI to do a technology strategy project.
25 They have 26 different entities they're looking

1 into. They range from agriculture to computer
2 technology to wind turbines to microturbines. We
3 use huge turbines up on the North Slope, so that
4 was of particular interest to us.

5 Again, it was a sharing of information
6 in a forum where we could come together. We
7 involved in the IEA greenhouse gas reduction
8 program. And we've taken a lot of steps, as a
9 major investor, one of the major investors in the
10 world, in China through our chemical processes to
11 work with the government of China to try to find
12 ways to move their current energy load into
13 different sectors.

14 Using those processes we were able to
15 also come inside of our own business units and
16 focus on the elements. Obviously energy
17 efficiency was one. Furnaces and heaters and
18 turbines are a major component of what any major
19 energy company asset base has incorporated.

20 CO2 capture and separation. Well, this
21 is particular interesting. We inject almost 7
22 billion cubic feet of natural gas on the North
23 Slope of Alaska every day. To give you some
24 quantification of that, the City of Chicago, in a
25 real cold winter day, uses about 8 bcf, and we're

1 injecting about roughly that amount into the
2 formation to help us pressurize Prudhoe Bay, one
3 of the nation's largest and oldest producing
4 fields, which you all benefit from in California.

5 Every single day we do that with great
6 big Rolls Royce turbines, and we're looking for
7 ways in which we can enhance the efficiency of
8 those turbines. And now we're actually working
9 with the Department of Energy for ways in which we
10 might be able to take the CO2 emissions from
11 turbines or pressure release flares and actually
12 use that as a municipal injectant.

13 As I'm sure you could be aware that the
14 Governor and the people of Alaska would like to
15 sell the natural gas instead of re-inject it back
16 in the ground. So, as we look towards the future
17 we're looking for ways to keep the pressure on the
18 field and use the natural resource base to the
19 benefit of the economics of the State of Alaska.

20 Again, I mentioned this earlier. Then
21 there was, as I like to refer to it, the things
22 that we do today. We did the Noel Kempf project,
23 which was 30 million tons of CO2 emissions
24 reduction.

25 Interestingly enough, to the U.S.

1 government, the government of Bolivia wanted to
2 keep some of those tons for its use.

3 We've identified a number of energy
4 efficiency projects in developing countries. And
5 some of those we're hoping to move forward in the
6 next 18 months with CDM.

7 We've done some methane capture process.
8 We have secured the right to do solar for the
9 Olympic Village in the upcoming Olympics in
10 Australia. And we are currently working with the
11 City of Los Angeles, we're very hopeful to be able
12 to provide solar power here in Los Angeles, as
13 some of you know.

14 This was a particularly exciting event
15 for me, because at this event we did this event
16 with Sir John at Yale University. And I think
17 part of having an opportunity to speak to people
18 is the human side of the equation.

19 We did this speech at Yale University
20 before the business school. Some of the young,
21 bright minds in the country. One of the reasons
22 we did it is one of the real challenges that up
23 and coming companies of the 21st century have are
24 recruiting people to work for them. And if you
25 don't have monster.com or .com behind your name,

1 you're not as exciting a company for some reason
2 to solicit.

3 And so we went to the Yale Business
4 School and we delivered our target and timetable
5 speech last September. The President of the
6 United States was kind enough to congratulate us
7 on taking this move.

8 So we actually, in place today, have a
9 10 percent reduction of the 1990 baseline. Many
10 of my colleagues in the industry have called us
11 out of the church. Many of my industry colleagues
12 said it's not really 10 percent, because you plan
13 to grow, because energy is going to be in more
14 demand in the future. How can you do this.

15 Well, we've taken the bold step, and I
16 have to congratulate my management and my
17 colleagues at BP Amoco because it's exciting. And
18 it's driving another process that I'd like to take
19 a moment to speak to.

20 And then the second bullet point there
21 that is equally as important, and I hope something
22 that the State of California takes away from
23 today, is the opportunity to move from a command
24 and control environmental regime to one that at
25 least has some market-driver dynamics in it.

1 We have an emissions trading program,
2 and let me flip to that just real quickly, and
3 then I'm going to come back. We have an emissions
4 trading program and this is an old slide. This
5 slide goes out of date every week.

6 And I'm delighted to tell you that
7 everyone thought when we began the emissions
8 trading program, and again our partnership with
9 EDF has been absolutely invaluable here. They
10 have some very talented people who have been
11 involved in SO2 trading. And we borrowed that.

12 Well, currently we have 130 assets
13 around the world, and we took about 15 of those
14 assets. We picked those assets so that somewhere
15 in developing countries, somewhere in developed
16 countries, some assets were refineries, some
17 assets were chemical companies, some assets were
18 production fields, and we gave the managers some
19 fictional money, \$25 million worth of fictional
20 money. And we said, here's your targets and your
21 timetables, and begin to trade.

22 And what we've had over the course of
23 this year, which is the first year we've run the
24 program, we've had I think it was of yesterday, 36
25 trades. We've traded over 350,000 tons of CO2

1 emissions reductions. And what this process has
2 done is it's found tons.

3 It's been a market-driven process
4 because these guys, and I'm going to come back to
5 the target and timetable here, what we
6 additionally did was we incentivized through the
7 pay structure of our managers of our business
8 units a reason to ask their employees to go find
9 emissions reductions.

10 So, on the performance contracts with
11 each of our business unit leaders, and we have 135
12 of them, there's an emission reduction number in
13 there. A hard target number. And for their pay
14 this year one of the things they have to do to get
15 their full bonus is to deliver that emissions
16 target.

17 And what we did in terms of setting up a
18 trading program was we piloted it and road-tested
19 it so that we could find whether people said, oh,
20 you've done all your energy efficiency. And what
21 we found is we found a lot of opportunities to
22 reduce CO2 emissions because people were looking
23 for the first time.

24 And I know what time I've got now so I'm
25 going to slip to an anecdote very quickly. I want

1 to give you an anecdote because it's real, real --
2 again, it puts the human face on a topic that's
3 very complicated, very technologically driven, but
4 at the end of the day it's the people in these
5 facilities that have to deliver these reductions,
6 and it's the consumers that we serve that have to
7 make these choices.

8 What we found by putting those targets
9 in is we have, as I'm sure you would expect, some
10 gruff managers who thought this was the flavor of
11 the day by senior management. I don't know
12 whether you've had any of that in your companies,
13 but we have some of that still left in ours.

14 And we gave them their targets and we
15 had one guy that ran a pipeline here in the United
16 States. And he called his team in and he said,
17 "Well, we gotta do this, the boss in the big
18 building wants us to do this." And so he brought
19 his team in. They were a couple of younger
20 people, although I don't want to have the
21 characterization that this had to be driven by
22 young folks.

23 But some of the younger team members
24 took it on because it was something they wanted to
25 do. And they went out and they found that the

1 valves in the pipeline were pressure valves. And
2 that every time the pipeline had to move the gas
3 the pressure valve would open and they were losing
4 450,000 tons of CO2 equivalent methane a year.

5 And then, of course, they wanted to
6 change the valves. So they had to go back and
7 they had to sell this to the business manager, and
8 so what they did was they ran what we call a ROCE
9 calculation, a return on capital employed, and
10 they found that they were going to get a 60
11 percent return on a \$2 million investment to
12 change the valves.

13 They changed the valves. We now sell
14 450,000 tons of methane instead of spewing it into
15 the atmosphere. And they got to be in the trading
16 program, and they got \$20 a ton from a guy in a
17 refinery who thought that that was actually a
18 better way for him to hit his target than to spend
19 X amount of dollars to come to closure.

20 So I think one of the things that I want
21 to leave and share with you on behalf of the
22 people at BP Amoco, is just the process of setting
23 the targets and timetables for us has helped give
24 somebody a target to try to strive to. And we
25 fundamentally believe if we give people financial

1 targets they can hit them. We fundamentally
2 believe that that is a system that works.

3 And the process of bringing people
4 together and sharing the information has been a
5 very exciting one. And it's one which when we
6 went to the merger, another anecdote very quickly,
7 it was the one thing that all the employees of BP
8 said to the boss before the Amoco transaction was
9 completed. We had 300 pages of emails to the
10 chairman from our employees saying, hope you keep
11 our climate change program through this merger.

12 And that was one of the things, I'm
13 proud to say, that Sir John negotiated with Mr.
14 Fuller. And so it's now over the Amoco system.
15 And hopefully it will be over the ARCO system, as
16 well.

17 So I want to thank you again for the
18 privilege of being with you. I look forward to
19 the dialogue. You have some of the best experts
20 in the country. And thank you, again.

21 (Applause.)

22 MR. SMITH: Thank you very much. I
23 think that the anecdote dealing with the gas
24 pipeline valves is a very good example of doing
25 well by doing good.

1 Our next speaker is Judith Bayer. As
2 Director of Environmental Government Affairs for
3 United Technologies, Judith serves as the top
4 liaison with government policymakers on
5 environmental and worker safety issues.

6 She's a nationally recognized expert on
7 climate change. She also serves as Chair of the
8 International Climate Change Partnership, and is
9 United Technology's Representative on the Pew
10 Center Global Climate Change Business
11 Environmental Leadership Council.

12 Ms. Bayer represented UTC at the
13 International Climate Change Negotiations in 1997
14 in Kyoto, and in 1998 in Buenos Aires and also at
15 the deliberations in Bonn in 1988 and 1999.

16 She will discuss UTC's policies on
17 reducing greenhouse gas emissions and the
18 potential global climate change impacts.

19 Judith.

20 MS. BAYER: Thank you. It's a pleasure
21 to be here this morning with you to talk about UTC
22 strategy in addressing global climate change. Our
23 corporate philosophy is be there first. And so we
24 were quite disappointed that BP Amoco beat us out
25 of the box on this one, because not only did we

1 lose that be there first, but it also means I have
2 the unenviable task of always following Mike or
3 one of his colleagues in these sorts of
4 presentations.

5 So, Mike always gives a good
6 presentation. It's a tough act to follow, but I'd
7 like to share with you UTC's experience in
8 addressing global climate change.

9 The message I want to leave with you
10 today is that there is no silver bullet, there is
11 no single strategy, there is no magic potion for
12 dealing with climate change. And I think you'll
13 see from my colleagues on the panel today that
14 each company brings a unique perspective to this,
15 and a unique set of solutions that meet their
16 needs.

17 The message in my mind is that now is
18 the time to innovate, now is the time to
19 experiment, and to press the envelope to see what
20 is possible. To learn what works. And, perhaps
21 more importantly, what doesn't work and why.

22 If you have an experimental test lab and
23 all they generate are successes that's a clear
24 indication that they're not pushing the envelope.
25 And so I think what we'd like to see out of the

1 panel today is the variety of ways the companies
2 are addressing climate change.

3 But first an introduction to United
4 Technologies. We are a large diversified
5 corporation that serves building sector as well as
6 the aerospace sector. And our best known products
7 include Carrier air conditioners, Otis elevators
8 and escalators, Sikorsky helicopters, Pratt &
9 Whitney jet engines and ONSI fuel cells.

10 So you see we have a very diversified
11 product mix which again says to us no single
12 solution will work for United Technologies, and
13 therefore as a microcosm of society perhaps that's
14 a message for the greater community.

15 We're a \$25 billion corporation and we
16 do business in 183 nations at 1900 locations.
17 Because of our global presence the global issue of
18 climate change has clearly risen very high on our
19 radar screen.

20 We also have a large employee base
21 around the world, and we feel very strongly that
22 employee base on a global basis is an opportunity
23 for us to educate and to reach out to those
24 employees as public citizens to impact their
25 lifestyles and the choices they make in how they

1 consume energy at home, as well as what they do
2 while they're on the job.

3 The other important piece of context for
4 you is that we spend an average of a billion
5 dollars a year on research. And because of that
6 research investment we need to be looking ahead to
7 see where best to place that investment dollar.
8 What sorts of technologies are going to be needed
9 in the years and the decades ahead. And how do we
10 again get ahead of that power curve in investing
11 our money today in the areas that are going to be
12 important tomorrow.

13 We have a presence here in California
14 with 15 facilities and about 1500 employees.
15 We've done an annual inventory and baseline of our
16 emissions, and here in California we emit about
17 18,000 metric tons of CO2.

18 On the other side of the equation we
19 also have ten fuel cells installed here in the
20 State of California that help avoid greenhouse gas
21 emissions. And so when you start to net out the
22 environmental footprint of United Technologies in
23 the State of California, we have credits and we
24 have debits here in the state.

25 I would also point out that California

1 is the home of the first two fuel cells that we
2 installed on a worldwide basis. We now have 130
3 of the PC25 units operating on a worldwide basis.
4 Those units are 200 kW stationary power plants
5 that are increasing their ability to avoid not
6 only greenhouse gas emissions, but other
7 pollutants with a source of clean energy.

8 Our journey in the greenhouse gas
9 emission and climate change issue really goes back
10 to the late 1980s when we formed an energy
11 council. And that was kind of the ad hoc response
12 to some things that were happening in the late
13 '80s.

14 In 1996 we codified our experience in
15 this policy statement that was really driven by
16 our Chairman George David. And it committed us to
17 look at natural resource conservation as part of
18 our corporate policy in protecting the
19 environment. And you'll notice that the policy
20 statement speaks directly to our products, how we
21 can serve, and not only the manufacture, but also
22 the design, the use and the disposal of our
23 products for a life cycle, comprehensive and
24 holistic approach.

25 In 1998 our Chairman was one of the

1 folks that Mike was talking about that stuck their
2 head above the horizon on this issue and said that
3 yes, there are uncertainties associated with the
4 climate change issue. But we're businesspeople,
5 we deal with risk all the time. We never have 100
6 percent of the factual information we'd like when
7 we make a business decision. And climate change
8 is no different.

9 And therefore, we have taken the
10 approach that although there are uncertainties,
11 scientifically, technologically, economically, we
12 believe the prudent course is to move forward with
13 no-regrets types of strategies to seek to reduce
14 greenhouse gas emissions.

15 And so if you look at our products
16 you'll see that that commitment has already borne
17 fruit. As I said, our ONSI fuel cells in their
18 deployment around the world are helping to
19 mitigate. The UTC technology is helping countries
20 to reduce their greenhouse gas emissions.

21 Our Carrier Air Conditioner folks have
22 also been a leader in this area. The Evergreen
23 Chiller, which is an industrial type chiller
24 technology, is now 21 percent more efficient than
25 the products that we fielded just six years ago.

1 The Pratt & Whitney example, I think, is
2 also illustrative of how our company has always
3 been sensitive to fuel efficiency and energy
4 efficiency in our aerospace products. If you look
5 at an airline a tenth of a percent of fuel burned
6 improvement means millions of dollars of profit to
7 that company over the lifespan of that jet engine.

8 Jet engines fly for decades, not years.
9 We still have Pratt & Whitney JTAD engines that
10 were put in service in the 1960s that are still
11 safely flying today. And so the technology
12 investment that we make and the technology that we
13 field has long-term consequences. And the more we
14 can improve those efficiencies the better the
15 benefit as a whole.

16 So products is the first leg of our
17 strategy in dealing with climate change. The
18 second leg is our internal commitment on a
19 voluntary basis to reduce the greenhouse gas
20 emissions of our operations and facilities.

21 And here we created in 1997 an energy
22 and water base line for our global operations.
23 And I think, you know, there's some unique
24 features to UTC's program.

25 Number one, our program is not CO2

1 emission based. Our program is energy usage,
2 energy consumption based. So we've moved up the
3 pipeline to look at root causes and not what I
4 would contend are end of the pipe kinds of
5 solutions looking at emissions, but looking at
6 root causes.

7 And so our baseline around the world
8 includes all of our manufacturing sites, as well
9 as key nonmanufacturing sites. And, as an aside,
10 I would say that one of the key nonmanufacturing
11 sites is our world headquarters building. We
12 specifically designed the program to bring that
13 specific building into the program so that they
14 would feel the same pressures and the same kinds
15 of requirements that all of our operations are
16 subjected to on a worldwide basis. That was a
17 very conscious decision to lead by example and to
18 have corporate headquarters be part of this
19 program, as well.

20 You'll also notice that we've included
21 and perhaps broadened the boundary of what we
22 consider our environmental footprint by looking at
23 employee travel and our corporate aircraft.
24 Because we're an aerospace company, we operate a
25 fleet of 12 corporate aircraft. And so we brought

1 them into our baseline. We brought our employee
2 travel into the baseline, because as a global
3 corporation we send our employees on airplanes
4 around the world quite frequently.

5 The bottomline is we found we actually
6 use 37 trillion Btus of energy per year for a \$25
7 billion corporation. Now, to put this in context
8 I've heard the BP presentations where they have
9 one facility in Texas that emits 8 million tons of
10 CO2 per year. UTC is a \$25 billion corporation
11 and only emits 2 million tons per year.

12 So we are small players. I would
13 contend we're a small quantity generator in the
14 context of some of the more energy intensive
15 companies. And so that raises another question.

16 Why would a nonenergy intensive company
17 institute a program on energy consumption. And
18 the answer there is that we do have a program and
19 an ethic of continuous improvement. And where
20 there's an opportunity to wring efficiency out of
21 our operations it's something we're going to go
22 after.

23 And so not being energy intensive we
24 still feel there's a commitment; we still think
25 that there's a very important reason for us to

1 move forward with this initiative.

2 And so for us what we look at is how
3 many Btus it takes us to generate a single sales
4 dollar. Our goal is a normalized goal, and
5 therefore we're looking at Btus and how we can
6 more efficiently use them in all of our
7 operations.

8 Our natural resource conservation goal
9 is a 25 percent reduction. We're using our 1997
10 baseline as the starting point for that. And as I
11 indicated, it's normalized by sales. We're a
12 growing company, we expect to continue to grow
13 over the next ten years, and therefore we wanted
14 to set a directional goal versus a specific
15 destination goal for our corporation.

16 And so the goal that we've established
17 includes both energy and water. And I would say
18 that this is another unique feature of how we've
19 attempted to combine more holistically the
20 environmental footprint of the corporation, and
21 look at natural resource conservation versus CO2
22 emissions.

23 Now, that's developing some very
24 interesting scenarios for us. As our plants are
25 beginning to implement these programs on a single

1 track, we're finding some strategies may reduce
2 your energy consumption, but in fact, has an
3 implication for water and vice versa.

4 One of the strategies for conserving
5 water is closed loop systems. Well, that
6 increases your energy demand. And so it's forcing
7 our plant management to look holistically at what
8 are the tradeoffs, what are the benefits of either
9 focusing and optimizing energy versus focusing and
10 optimizing water conservation.

11 For every gallon of water that we don't
12 use, we don't have to pump it, we don't have to
13 treat it, we don't have to move it, and so we
14 believe that there's some real synergies here, and
15 therefore have taken a more holistic approach on
16 this.

17 I wanted to share with you a couple
18 examples of our chemical systems division here in
19 California and some of the good things that they
20 have done. This is a plant that's located in San
21 Jose. They've already achieved since 1997 a third
22 reduction in their energy consumption.

23 And it's a whole panoply of very simple
24 sorts of measures. Things like installing sensors
25 and timers and looking at their lighting

1 requirements, more rational use of space. It's a
2 lot of one- to three-year paybacks. Some very
3 simple housekeeping, no regrets sorts of things,
4 that have also delivered financial benefits.

5 The third prong of our strategy is on
6 the public policy side. And here we're very
7 active players both domestically and
8 internationally, in helping to inform the debate,
9 and helping to share the lessons learned of our
10 corporation. And also sharing in finding out what
11 other companies are doing.

12 I was also asked to talk about some of
13 the internal, as well as external, initiatives.
14 In putting together our global baseline we had to
15 do a lot of training on a worldwide basis,
16 sensitivity awareness, how we wanted the
17 individual operating units to report their data,
18 so there's been intensive efforts in that area.

19 We've created an internet site that
20 provides tools for our facilities in China, as
21 well as Brazil, as well as Italy, so that
22 everybody can share and can access the information
23 on what the facilities are doing, where they've
24 had successes, and share that as the individual
25 entities want to access it.

1 We've used our employee publications,
2 we've used posters. You'll see two of our posters
3 here. Those are translated into 14 different
4 languages so that we could make them available,
5 again on a worldwide basis.

6 The outreach effort starts with our
7 Chairman. He spoke last year at the Earth
8 Technologies Forum in Washington. And he made the
9 same message that I share with you before, in his
10 quote, there are uncertainties, but let's move
11 forward. He's a champion of technology as part of
12 the solution. And United Technologies feels that
13 it does have solutions from our technologies and
14 our products.

15 And also emphasize the need for public/
16 private partnerships, to move this issue forward.
17 So he has been a great champion for this issue.

18 We're also participating in a study that
19 was funded by the Pew Center in helping to bring
20 together companies that have experience here, to
21 share their case studies, and to help inform the
22 debate and to provide some guidance for other
23 companies that might want to engage in this sort
24 of activity.

25 The lessons learned from my perspective

1 are that now is the time to innovate. And we're
2 finding just by doing we have learned a great
3 deal. You know, we started out with a policy on
4 how we were going to handle acquisitions and
5 divestitures, and then all of a sudden we had a \$4
6 billion acquisition and a \$2 billion divestiture.

7 And all of a sudden, you know, you start
8 to see, well, this is our theoretical approach to
9 this. Now we've got some real world examples.
10 How do we deal with those.

11 And so we're constantly refining our
12 program. We're constantly looking for
13 enhancements and ways that we can improve and
14 stretch the program. So we are attempting to
15 innovate and to experiment even with the program
16 that we have. And we would suggest that others
17 need to do the same.

18 We found that senior management buy-in
19 is absolutely essential. You heard Mike talk
20 about the role of their chairman. UTC's Chairman
21 was also a driving force on this. And I think
22 that that's a common theme when I talk to my
23 colleagues, that if you don't have senior
24 management buy-in on this it's going to be very
25 hard to move the process forward.

1 We also found that we chose a language
2 that crosses the linguistic barriers of all the
3 countries we operate in. And that is we're
4 looking for efficiencies. We're talking the
5 language of our plant management in helping them
6 to identify opportunities for improvement. And so
7 they have embraced this program. They have not
8 resisted it because we're speaking something that
9 they have as part of their objectives. And so
10 it's been a relatively easy sell because of the
11 way we have structured the program and the way we
12 have customized it to fit our culture.

13 And I'm sure you'll hear many examples
14 from the other panelists in a similar vein of how
15 individual companies are tailoring these programs
16 to meet their own circumstances. And that would
17 be my suggestion, as you move forward here in the
18 State of California, is to take the best
19 practices, to take a look at the strategies that
20 are out there, and provide flexibility for
21 companies to choose the models that meet their own
22 circumstances.

23 Thank you for the opportunity to join
24 you, and I look forward to the dialogue that I
25 hope will ensue.

1 (Applause.)

2 MR. SMITH: Thank you very much. I
3 think that your comments on the commitment to
4 continuous improvement, the role of management
5 leadership, employee involvement are very well
6 taken. As well as the importance of providing an
7 opportunity for organization, state or private, to
8 adapt within their cultural milieu.

9 Our next speaker is Don Cunningham. Don
10 is currently Director for Efficiency Solutions and
11 Public Benefits Programs for the Los Angeles
12 Department of Water and Power.

13 With over 19 years of working with
14 customers on energy efficiency measures, Mr.
15 Cunningham brings extensive experience in managing
16 these programs. Mr Cunningham also administers
17 DWP's electric transportation program, which
18 operates and maintains one of the largest fleets
19 of electric vehicles in the country.

20 He also has responsibility for the
21 company's photovoltaic energy generation program,
22 which has the goal of installing 200 million watts
23 of solar electric power within the next ten years.

24 Don will be speaking on DWP's public
25 benefits and green power programs. Don.

1 MR. CUNNINGHAM: Thank you. It is
2 definitely my pleasure to be here. I've been with
3 the Department of Water and Power for almost 20
4 years now, although it's only been about 19 years
5 since I first entered the general arena of energy
6 efficiency. We've called it a variety of things,
7 conservation, demand side management, any number
8 of things.

9 during those years I have -- certainly
10 have two teenaged children at home who will attest
11 that my personal commitment and enthusiasm to
12 energy efficiency hasn't diminished in all those
13 years.

14 And I'm going to be talking with you
15 today primarily about DWP's public benefits
16 programs. We have two primary goals for our
17 programs. One is to help convert DWP into an
18 environmentally responsive and commercially
19 competitive enterprise.

20 And the other is to use our public
21 benefits programs to deliver programs specific to
22 the community of Los Angeles that will both result
23 in energy efficiencies, reduced production and
24 emission of greenhouse gasses, and a key I think
25 is really raising consumer awareness in this area.

1 As a lot of you know, public benefits
2 programs were mandated by AB-1890, the electric
3 utility restructuring legislation in California.
4 There are four specific allowed expenditures of
5 public benefits programs. We're active in all
6 four of those areas.

7 Public benefits for DWP roughly 2.85
8 percent of electric sales for the five-year
9 window. With our level of sales that translates
10 to about \$60 million annual expenditures on these
11 programs.

12 For our fiscal year 99/2000, we're going
13 a little bit over our average annual expenditure.
14 We're having a large push, you see almost about
15 \$20 million dedicated to electric transportation
16 this year. I'll talk a little bit more about that
17 in just a minute.

18 Low income programs, many utilities have
19 had these for years. We've had ours for about 25
20 years now. Over the last year, though, we've
21 introduced a new service to our low-income
22 customers we call our neighbors, or neighborhood
23 bill reduction services program. It's a package
24 of energy efficiency programs that are tailored
25 for our low-income residential customers.

1 I think one of the key elements that's
2 led to the success of this program is we've used
3 five community based organizations to actually
4 deliver the program to low-income customers in Los
5 Angeles.

6 During this calendar year we've serviced
7 over 46,000 customers. We calculate over 14
8 million kilowatt hours that have been saved to
9 date.

10 We also are very active in exploring new
11 technologies in research and development. Our
12 electric transportation program is certainly one
13 of them. We just recently installed at our
14 headquarters a 100 percent solar powered rapid
15 charge system for electric vehicles.

16 We applied for a patent in the spring of
17 this year and expect by spring of next year to be
18 going into commercial production of a rechargeable
19 battery powered leaf blower. I noticed when I
20 walked in this morning, it's fall, the leaves are
21 all over the place, and there was a guy out there
22 blowing the leaves into piles. And there's this
23 little grey cloud kind of followed him around as
24 he moved around. And with our battery powered
25 leaf blower that little grey cloud will hopefully

1 become a thing of the past.

2 And we're also involved in research on
3 wind turbine development. One of the unique
4 programs we're involved in is partnership with
5 Harvard University School of Public Health, using
6 UVGI, ultraviolet germicidal irradiation, to
7 control infectious diseases, particularly in
8 places like hospitals and schools where there are
9 large populations of individuals.

10 And those facilities are required to
11 have a very high level of clean outside air, a
12 very high air turnover rate to maintain the level
13 of infectious disease microbes at acceptable
14 levels. By using an ultraviolet treatment of the
15 air, you can eliminate those microbes and
16 eliminate the major share of that air turnover.

17 I mentioned earlier our electric
18 transportation program. By the end of this year
19 we expect to have over 400 electric chargers
20 installed around Los Angeles. We are currently
21 operating 19 100 percent electric buses in Los
22 Angeles. We made it through the League of Cities
23 convention that concluded in L.A. this last
24 weekend with every one of those buses operating
25 fully operational and no problems with them.

1 We expect to have half-again as many of
2 those electric buses in service for the Democratic
3 National Convention in Los Angeles early next
4 year.

5 And we're also working with the other
6 transportation authorities. It's been a long time
7 since L.A. has had an articulated bus, one that
8 hinges, to make it around some of the tight
9 corners. And we're working with other
10 transportation authorities to develop an electric
11 hybrid articulated bus that we hope to go into
12 service in L.A. next year.

13 And the L.A. area has the first all
14 electric post office in the United States. The
15 Harbor City Post Office in the San Pedro area has
16 a 100 percent electric fleet for the mail
17 delivery. We accomplished that changeover late
18 spring, early summer of this year.

19 Our energy efficiency programs through
20 partnerships with other utilities and retailers,
21 we moved over 115,000 highly efficient, compact
22 fluorescent lamp fixtures in over 30 retail
23 outlets in L.A.

24 The New York Power Authority, NYPA, had
25 the first super-efficient refrigerator that was a

1 14.9 cubic foot model. We pioneered with Maytag
2 the development of a little bit larger model that
3 remains about 31 percent more efficient than the
4 refrigerators currently available on the retail
5 market. And we're making those refrigerators
6 available to low-income households through the
7 L.A. Housing Authority, through other housing
8 agencies, and ultimately our green power customers
9 will be able to buy those refrigerators.

10 We have also installed over 140,000
11 compact fluorescent lamps resulting in about 5
12 million kilowatt hours annual savings. We still
13 offer free on-site energy audits for customers who
14 want them, both for residential and small
15 commercial.

16 We offer cash incentives for high
17 efficiency lighting. And commend the Energy
18 Commission for the lighting in this room. I
19 notice with the new hearing room we've got D8
20 lamps and dimmable electronic ballasts and that's
21 pretty much the state of the art for office
22 lighting these days.

23 We're also just recently gotten approval
24 and we'll soon begin offering low interest loans
25 to all of our customers to install energy

1 efficiency measures. We will basically be passing
2 the money on at our cost. And we will calculate a
3 payback period for the measure that's being
4 installed. We'll amortize the loan over that same
5 period, so the customers will be able to install
6 energy efficiency and basically at a zero cash
7 flow.

8 We hope we've removed the last obstacle
9 and objection to customers, is that initial
10 capital hit to install the energy efficiency
11 measures.

12 Our school program is one of the unique
13 programs we've developed. It received last year's
14 California Municipal Utilities Association award
15 for best use of AB-1890 funds. It's a combination
16 of energy efficiency assistance and tree planting,
17 in partnership with the Los Angeles School
18 District, where we planted over 4000 trees this
19 calendar year at 42 school campuses.

20 By planting the trees to provide
21 strategic shading for building and HVAC equipment,
22 we reduced building temperatures, reduced school
23 operating costs, not only do we reduce carbon
24 dioxide emissions from power generation, but
25 planting the trees also remove atmospheric CO2.

1 We've introduced into the LAUSD
2 curriculum information on the environment, the
3 importance of the trees. And in this program, as
4 well, we hire people from the community, this one
5 targets at-risk youth, to both plant and maintain
6 the trees.

7 Our solar photovoltaic program, as part
8 of the federal million solar roof initiative, DWP
9 has pledged to meet 10 percent of that goal by
10 installing 100,000 solar electric rooftops by the
11 year 2010.

12 Some of the benefits we expect to bring
13 from this are to build enough of a market in Los
14 Angeles that will locate manufacturing facilities
15 in L.A. We'll bring jobs to L.A. We hope to have
16 the PV systems cost competitive with the
17 residential electric rates by 2005 simply by
18 driving the demand, introducing economies of scale
19 and bringing the production costs down.

20 And, of course, my slide says most
21 environmentally benign. I believe solar
22 photovoltaic is the second most environmentally
23 benign energy source we have. I really think the
24 most environmentally benign source is the kilowatt
25 of energy that we save through energy efficiency,

1 and we don't have to generate at all. But then if
2 I'm Director of Energy Efficiency, I guess that
3 would be my bias.

4 Our green power program in Los Angeles
5 is not actually funded by our public benefits
6 program. We use public benefits to support it.
7 And through this program our customers can choose
8 to have a portion of their energy supplied by new
9 renewable resource. And that's one of the unique
10 things about DWP's program, is we have made a
11 commitment to bring into our generation mix new
12 renewable resources as customer demand for green
13 power increases.

14 We have already had over 20,000 of our
15 customers sign up. We launched this program in
16 the spring. In about the first six months, we've
17 got -- that translates to about 1.5 percent of our
18 customer base that has made the commitment to
19 green power.

20 Another one of the aspects of our green
21 power programs, green power is more costly than
22 gas or coal-fired power, and our program has a
23 premium for the green power. But we packaged the
24 option to buy green power with energy efficiency
25 support, the goal being to make the decision to

1 buy from renewable sources being no cost.

2 For residential customers we provide
3 compact fluorescent lamps. We provide energy
4 assistance or energy efficiency and audit
5 assistance. We have a CD available that all green
6 power customers are offered the option to use,
7 that will allow them to program in the particular
8 characteristics and energy use of their home. And
9 it will do an energy use analysis for them. For
10 those that aren't literate in computers and CDs,
11 we will send someone out to the home and do the
12 audit for them.

13 And we also provide discounts on energy
14 efficient appliances, additional compact
15 fluorescents, high efficient fans, the super-
16 efficient refrigerator that I discussed earlier.

17 This slide really is just to illustrate
18 that we don't spend very much money at all
19 communicating our programs. Most of our funds are
20 going to implement the programs. We don't do any
21 tv advertising. We try to get a few public
22 service announcements. Do very minimal radio
23 advertising. Most of our communication of our
24 programs are through directed mailings to
25 customers we think would most benefit by them.

1 Through participation in trade shows and community
2 events and largely word of mouth.

3 I think the bottomline for our programs
4 at DWP, clearly our programs are designed to lower
5 our bills for our customers. That's what they're
6 concerned about. Lowering their overall load
7 reduces our electric demand.

8 We definitely want to increase our
9 generation from renewable sources. We want to
10 target reduced greenhouse gas production from both
11 our stationary and the mobile sources, and that's
12 a large part of our emphasis on particularly
13 electric mass transit with the buses and shuttles.

14 And the bottomline in our mind is we
15 hope this will result in a cleaner and more
16 healthy environment for both the current and
17 future generations.

18 I also want to thank all of you for the
19 opportunity to be here this morning. I'm looking
20 forward to the dialogue this afternoon, and I hope
21 that this is the start of a continued dialogue
22 among industries in California that can address
23 these problems.

24 Thank you.

25 (Applause.)

1 MR. SMITH: Thank you very much. I note
2 the Energy Commission shares with the Department
3 of Water and Power in Los Angeles a number of
4 programmatic objectives, and certainly the focus
5 on energy electric generation efficiency and use.
6 And also on clean electric transportation. We
7 have a number of common goals there.

8 And I think also your comments about
9 battery-powered leaf blowers are close to our
10 hearts. Thank you.

11 The next speaker I'd like to introduce
12 is Ravi Kuchibhotla. Ravi Kuchibhotla joined
13 International Business Machines in 1983, and
14 assumed his current position as Corporate Program
15 Manager for Energy Management in February of 1997.

16 Before working at IBM he was a plant
17 electric manager at General Electric in
18 Bridgeport. Ravi has a bachelors degree in
19 electric power engineering and an MBA in marketing
20 from St. John's University in New York.

21 He will give us IBM's perspective on
22 global climate change and the environmental and
23 economic benefits that result from the company's
24 aggressive energy conservation policies over the
25 last decade. Ravi.

1 MR. KUCHIBHOTLA: Good morning. I would
2 like to thank the California Energy Commission on
3 behalf of IBM for giving me this opportunity to
4 present about our perspectives on the global
5 climate change and also about our energy
6 efficiency and energy conservation programs.

7 Because of the limited time I'll get
8 right to it. Briefly, I'll be showing about IBM
9 energy. I'll go through the agenda briefly here
10 about IBM Corporation, and then I'll show you what
11 our global climate change perspective is, and what
12 our strategies are on our per fluorocompound
13 emission reduction targets and energy programs in
14 a nutshell, energy management objectives and
15 challenges. And then the energy conservation
16 goal, we have a 4 percent energy conservation
17 goal. What is it and how is it set. And how are
18 the savings calculated. And then briefly show how
19 we collect the energy data and reports. And also
20 the last ten years results, some may critical
21 census factors from our perspective, and then a
22 summary.

23 IBM operates in about 13 countries. As
24 you can see there, we have 32 worldwide
25 manufacturing and development sites. And out of

1 that 14 are the United States. And we have a big
2 storage plant in San Jose, along with two other
3 research sites near San Jose.

4 And last year our number of employees
5 were about 291,000. And last year our revenue was
6 \$81.7 billion. And that's what we do in the
7 industry. And we have gotten numerous awards on
8 this from the EPA. We got the Foster Climate
9 Protection Award in 1998, and also as recently as
10 last month we were honored by EPA by becoming the
11 climatewise partner achievement partner.

12 And also last year we got an Alliance to
13 Save Energy Award in the presence of the Secretary
14 of Energy. That was a great honor. And we are
15 two years in a row, 1998 and 1999, we are the
16 Energy Star computer, as you all know.

17 On global climate change it's a complex
18 problem, and IBM acknowledges the increasing
19 evidence about climate change and we are aware of
20 the data that cause the scientists and other
21 experts to warn against the dangers of climate
22 change resulting from human-induced emissions of
23 greenhouse gases. And we realize that such
24 climate change could impact the economy and the
25 quality of life for current and future

1 generations.

2 And we believe there are cost effective
3 strategies available to reduce greenhouse gas
4 emissions. That voluntary demonstration of such
5 strategies is an important part of the early
6 climate reduction efforts, and that voluntary
7 initiatives provide an opportunity to demonstrate,
8 cooperate with national leadership and enhance
9 long-time corporate competitiveness.

10 So having said that, our strategy is to
11 pursue energy efficiency both in our products and
12 facilities around the world, and also reduce our
13 PFC emissions. Here PFC, I refer to
14 perfluorocompounds. It's different from
15 perfluorocarbons.

16 Information technology, and we believe
17 can and will play a role in this climate change,
18 in modeling and whatever is needed. And we
19 support research and development on renewable
20 energy technologies where feasible. And reduce
21 greenhouse gas emissions from our semiconductor
22 manufacturing process.

23 And our preferred approach to this
24 climate change problem is to reduce greenhouse
25 gases based on a market-driven flexible technology

1 oriented policy.

2 On the PCF emissions reduction target,
3 IBM was the first semiconductor manufacturer to
4 establish a numerical perfluorocompound emissions
5 reduction target. What is it? IBM's goal is to
6 reduce PFC emissions by 40 percent index to
7 production by the end of 2002, using 1995 as the
8 baseline from its semiconductor manufacturing
9 process.

10 And what is included in this target? We
11 included six gases, greenhouse gases. And this is
12 a challenge to remember all these chemical formula
13 here. Nitrogen -- they include a nitrogen
14 trifluoride, tetrafluroromethane and
15 hexafluoroethane, octofluoropropane, and then
16 sulfur hexafluoride, trifluoroethane.

17 These are the six gases of this target.
18 And I'm not an expert on the PFCs, so if you have
19 any questions or if you need more details, please
20 either call or write by email to Edan Dionne on
21 our staff, CES Staff.

22 At our IBM Burlington facility they
23 invented a dilute NF3, that is nitrogen
24 trifluoroprocess, that replaces the
25 hexafluoroethane in semiconductor chamber cleaning

1 process. After the complete switch-over it will
2 result in greater than 95 percent reduction in PFC
3 emissions from the chamber cleaning process.

4 It's been arguably most efficient for
5 others, for our competitors, as all semiconductor
6 manufacturing processes vary immensely.

7 Coming to the energy programs, this goes
8 back to the early 1970s when Frank Carrey was our
9 chairman, early 1970s, he issued a corporate
10 policy that carried the number 139. And this
11 policy has about 11 limits.

12 One of them is energy efficiency.
13 Responsible use of corporate -- energy throughout
14 IBM's business. And this policy is given in the
15 environmental report on the last page, those of
16 you who are interested in full details, and they
17 are distributed out there. So please take a copy.

18 And then it's like a hierarchy, then
19 after the policy we have a corporate instruction
20 specifically for energy management. And this
21 calls for a lot of things. It's like in a
22 structured way. It defines what the major
23 locations are in IBM. And all such major
24 locations should have energy managers, designated
25 energy managers.

1 And they need to come up and get all of
2 the site energy master plans every year. Get them
3 reviewed and approved by the site CD location
4 managers. And then a copy of that to me.

5 And then the other thing that's called
6 for in the instruction is all the major sites need
7 to report the quarterly energy metrics into our
8 energy database.

9 Those are the primary things from the
10 corporate instruction perspective. And the
11 energy, these are primary past in all our internal
12 audits, as well as ISO14001. Probably IBM is the
13 only company still that has a single certification
14 for all the -- we have a single certification for
15 all the 32 sites or so.

16 And as I said before, we have a 4
17 percent energy conservation goal. This has been
18 coming from early 1970s. And also the energy
19 programs we provide support to recognition
20 programs and get a lot of external recognition, as
21 I have shown before.

22 And we are, for all our U.S. M&D
23 locations, 14 U.S. M&D locations, they participate
24 in a climatewise partnership, a voluntary program
25 of the EPA. Since 1995 we started filing the

1 voluntary greenhouse gases report with the
2 Department of Energy. We are one of the first
3 three companies, along with Johnson & Johnson and
4 the GM being the other companies, to start filing
5 this.

6 The way we file this report is we
7 collect, our emissions report is based on the
8 actual emission factors supplied by the utility
9 companies.

10 And as recently as a couple of months
11 ago we started -- we became a partner in the EPA's
12 Energy Star buildings program. And under this
13 program we have committed 7.5 million square feet
14 in the U.S.

15 And these are the four objectives of our
16 energy programs. To improve the environment we
17 live in, and to reduce the cost of business
18 operations and insure procurement of reliable
19 energy at the lowest possible rates for all IBM
20 locations.

21 To increase the shareholder value
22 through utilizing energy efficiency gains
23 achieved. To achieve continual improvement
24 through ISO14001 certification program.

25 And, as I said before, our energy

1 conservation goal is 4 percent. This is a very
2 stringent goal. This is based on the actual
3 energy consumed every year. These two terms
4 define what they are, conservation, as well as
5 cost avoidance.

6 And basically how we set all our M&D
7 sites, they average anywhere from 4 to 6 percent
8 per year. All our sales and distribution
9 buildings, it varies from anywhere from 1.5 to 2
10 percent.

11 So if we take an average for the last
12 five years or so, it's hovering anywhere from 3.1
13 to 4.52. So that's how we set our goal. And
14 that's a formula which I'm not going to go
15 through. That's how we calculate the energy
16 conservation.

17 And our energy conservation credits are
18 given only for the last 12 months, based on the
19 performance. And any reductions in usage because
20 of the down-sizing or change of function or
21 whatever is not included in this 4 percent.
22 That's separate.

23 In the data collection and reports-wise
24 we have currently a Lotus Notes based database,
25 very flexible. And, as I said before, we collect

1 quarterly data from all the people. And we
2 publish annual energy reports that's with the
3 green covers. And these reports are seen by the
4 senior management of IBM, including our chairman
5 and CFO and everybody.

6 And we file the voluntary greenhouse
7 gases report to DOE. And also we have started
8 publishing this environmental report since 1990.

9 These are the last ten-year results from
10 1989 to 1998. As you can see at the bottom I'll
11 be showing you in the next slide, in a nutshell,
12 we conserve about 8.2 billion kilowatt hours of
13 electricity. That is a 10.7 percent of total
14 electricity usage. And in terms of -- it's
15 equivalent to electricity used by 1.4 million
16 average homes a year in this country.

17 Avoided more than 5.66 million tons of
18 CO2 emissions. That's almost equivalent to
19 emissions from about 1.41 million cars driving
20 10,000 miles they have taken away off the
21 highways.

22 Saved IBM about \$518 million in expense
23 by pursuing this program. That's almost
24 equivalent to 64 percent of 1998 yearly dividends
25 paid to IBM shareholders.

1 And these are some of the critical
2 census factors. First of all, we need to have a
3 good target, and then having a good environmental
4 infrastructure in place is an important aspect of
5 it. And having a good and useful environmental,
6 as well as energy database. And then collecting
7 accurate emission data from the utility suppliers
8 is also an important aspect from our perspective.
9 And getting attention from the top management, as
10 the other companies pointed out, is a must.

11 Sharing in technology, technical
12 knowledge and ideas, by holding conferences,
13 energy conferences and so on. This year in the
14 month of March we held a three-day worldwide
15 energy conference open to internal IBM'ers. We
16 exchanged a lot of ideas there and that pumps up
17 the psyche of everybody and then they go back and
18 achieve more.

19 Monitoring performance results audits.
20 ISO40001 included, and year-to-year comparisons,
21 those kind of things are important. And
22 communicating or recognizing good results is also
23 very important. And participating in the
24 voluntary initiatives programs is a good census
25 factor.

1 So, in summary, what I say is
2 aggressively pursuing energy conservation and PFC
3 emissions reduction on a long-term basis is an
4 effective approach. To meet with not only the
5 global climate change challenge but also to reduce
6 cost of operations and to increase the shareholder
7 values for continual improvement.

8 MR. SMITH: Thank you very much.

9 (Applause.)

10 MR. SMITH: Yes, thank you very much,
11 Ravi. That's another good example of building
12 environmental values into corporate culture and
13 producing substantial savings in the process.

14 Our next speaker is James Callaghan.
15 Mr. Callaghan is Vice President for Real Estate
16 and Facilities with Qualcomm, one of the nation's
17 leading wireless technology manufacturers.
18 They're headquartered in San Diego.

19 He has responsibility for all U.S.
20 domestic and international real estate and
21 facilities, engineering and construction,
22 administrative services, goods movement, as well a
23 their environmental health and safety programs.

24 Mr. Callaghan will present an overview
25 of Qualcomm and the activities of its energy and

1 water resources committee.

2 MR. CALLAGHAN: Thank you. Thank you
3 for inviting us up today. We're a relatively new
4 player in the climatewise program. Our company's
5 only been in existence for about 15 years. And
6 some of the other distinguished panel members
7 today I've learned an awful lot this morning.

8 A couple things I wanted to cover today
9 is what we've done from an energy efficiency
10 standpoint with our facilities in the San Diego
11 area.

12 We are again Qualcomm, Incorporated, and
13 we're broken into five divisional units. I just
14 wanted to give you a quick overview. Our
15 technology licensing; our CEMA technologies, which
16 is our chip business; our consumer products, which
17 is our phone business; wireless systems, which is
18 both the satellite communication systems for the
19 two-way communication systems for the trucking
20 industry and our latest global star program, which
21 will be satellite-based phone and data
22 transmission. And then our technologies. We're
23 always developing and we're obviously the leader
24 in the wireless business world.

25 One of the things that led us to take a

1 look at our energy efficiency and our energy usage
2 was our substantial growth in facilities in San
3 Diego alone. As you can see from the graph here,
4 I joined the company in '93 and have been through
5 this growth curve that we've done over the last
6 six years. We're up to 3 million square feet
7 currently in San Diego. We have 700,000 square
8 feet of factory floor space in San Diego, and all
9 of our design, implementation, manufacturing is
10 done in the San Diego area.

11 And so when we looked at this and
12 becoming a member of the climatewise program, and
13 looking at energy efficiency, we synched up with
14 the DOE and we looked at -- this is the pie chart
15 here. It shows that energy use by facility type
16 in the State of California. And obviously we fit
17 into the office and R&D pool, which makes up the
18 largest percentage of the pie of the energy usage.

19 We then looked at the energy use of the
20 office and the R&D and how that pie breaks out
21 between space cooling, space heating, lighting and
22 the other areas as indicated there.

23 And through our savings programs over
24 the last four years you can see if -- it comes out
25 clearly. You can see in our energy savings the

1 chunk that we've taken out of the State of
2 California average in lighting and in space
3 heating and in space cooling and water heating,
4 and the other applicable areas.

5 We've felt we've really done a good job
6 over the last four years in reducing the overall
7 cost of our utility consumption.

8 One of the ways that we looked at this
9 is, you know, how do we achieve the same savings.
10 We took a team approach, we formulated an energy
11 and water resources committee comprised of our in-
12 house staff, the local utility company, SDG&E in
13 San Diego, and our outside consultants.

14 One of the things at Qualcomm is we're
15 only about 10,000 employees today. We're
16 substantially growing, but in my role I play the
17 Vice President of real estate, construction,
18 facilities, and also as the energy person. So we
19 wear several different hats within our
20 corporation, but we're getting to the point where
21 we will probably be hiring an energy manager in
22 the future to take that over.

23 So the goal, and again the San Diego
24 regional energy office and Kirk Cramer, the
25 executive director, is the one who got us into

1 more of these programs early on in Qualcomm's
2 growth.

3 The goal of the team is to identify
4 energy saving projects; to save money; improve
5 efficiency; and to reduce pollution. We have a
6 project assigned to each specific area that we
7 identify at the beginning of our fiscal year, our
8 new construction project, of what his task is,
9 what agency he needs to coordinate with for the
10 different programs.

11 The programs that Qualcomm has
12 participated in which was early mentioned by Don
13 is lighting retrofit programs, new construction,
14 savings through design, motor replacement, exit
15 sign replacement. We have almost every one of our
16 new buildings and our existing buildings that we
17 go and lease, we come in and completely gut the
18 building nine times out of ten, because of the use
19 of the building, and we come in and do complete
20 lighting retrofits. High efficiency ballasts, TA
21 lamps, occupancy sensors in all the offices so
22 that -- and the low-use areas, conference rooms,
23 break rooms and stuff like that.

24 All of our motors that we go into on our
25 compressors, on our air conditioning systems are

1 all high efficiency motors. On our stainless
2 steel cooling towers we try to go for almost
3 everyone of the benefits that are offered out
4 there through the local utilities or state-funded,
5 or even federal programs for our energy
6 efficiency.

7 Additionally, since kind of our
8 inception of our committee -- this chart's a
9 little bit outdated -- we actually have done over
10 65 projects, from minor ones as exit sign
11 refurbishment, all the way through brand new
12 buildings.

13 And since 1993, as you can see from the
14 chart, we've total energy savings of over \$10
15 million kilowatt hours. And also we use about 93
16 million kilowatt hours annually. And as you can
17 see it's 11 percent of our current annual
18 consumption. And we've calculated out, based on
19 those savings at 11 percent, how much we've
20 reduced carbon monoxide or dioxide, sulfurous
21 oxide and nitrous oxide, and also carbon monoxide.

22 This is an example of one of our latest
23 programs that we also received a rebate on, and in
24 a future slide I'll show you, we have a large --
25 we consider it large for our size of our

1 company -- a 4 megawatt cogeneration facility.

2 And this facility is approximately 20
3 years old. We purchased it from Home Federal Bank
4 a few years ago, and we have gone through now, and
5 through some of these savings and climatewise
6 programs we're replacing all of our adsorption
7 chillers in the plant.

8 And so this is one of the gas-fired
9 adsorption chillers that we have put in instead of
10 electric chillers. And in our facility we also
11 have back-up chillers that are gas-fired because
12 of our operation.

13 And additionally, this is a picture of
14 the three turbine generators, they're solar
15 turbines, and we operate this plant at 80 percent
16 efficiency.

17 What that means is on the heat that
18 comes off of the turbine we are using 80 percent
19 of that heat, recovering it for hot water, chilled
20 water, and heating and cooling. So the 20 percent
21 left over is what ends up going out the exhaust
22 stack.

23 So we're really proud of this plant and
24 have, as I said earlier, we bought this plant
25 during the RTC and Home Federal, that banking

1 situation and have substantially poured probably
2 I'd say about 4.5 or 5 million into the plant to
3 get it more energy efficient and more cost
4 effective for our operation.

5 Additionally, strategies reviewed when
6 we look at a new facility or at an existing
7 facility is we look at everything, gas, heating,
8 cooking, domestic, boiler temperature night
9 setbacks, cooling, kitchen uses. We have five or
10 six major kitchens in the San Diego area. And one
11 of the things that we did recently is we switched
12 to paper, utilizing paper plates, paper napkins
13 instead of cloth, and typical plates.

14 And also within our company, just a side
15 note, and we have a substantial recycling program
16 where we have recycled over 2 million pounds alone
17 in our last fiscal year from paper to plastic,
18 miscellaneous metals from our factory production
19 floors.

20 Also, in the window treatment area every
21 one of our new building's high performance glass.
22 Low reflectivity, but very good high performance.
23 Again, our cogeneration, and we also have several
24 TES systems at some of our other buildings.

25 Electricity. Again, I touched on some

1 of these areas that we looked at. And under the
2 equipment utilization is another program that
3 we're instituting right now, companywide, with our
4 IT department is making sure that every monitor on
5 the desktop has the energy software available so
6 it will shut it down and completely turn off that
7 monitor. You can set the time in most of them,
8 but we're going through with some of the older
9 computers and bringing those monitors up to
10 compliance.

11 And also we've taken a hard look at the
12 water area. Don't know if some of you know, but
13 in San Diego they've installed a large grey water
14 plant. And so they are now piping the
15 distribution through the streets of San Diego, and
16 we're tapping into our major campuses and taking
17 advantage of the grey water to help also in
18 reduction, since it's such a dry climate in San
19 Diego these days.

20 Proposed strategies. We currently have
21 a 408,000 square foot manufacturing facility. And
22 with our team has taken a look at the proposed
23 energy conservation measures that we can take from
24 installing low temperature rated compact
25 fluorescent fixtures in walk-in coolers to

1 optimization of chillers for our operations in the
2 central plants.

3 These are a list of all the measures
4 that we have identified for one facility that
5 currently is online and operating. Installing
6 time-of-day controllers for compact fluorescent
7 fixtures in the central hall. This building is
8 approximately 1245 foot long, and it's one long
9 corridor with skylights. So we're installing all
10 the appropriate lamps and timeclock controllers to
11 shut that building down during daylight hours.

12 So these are all projects that we're
13 proposing to do on this one building. And we've
14 calculated that we believe that this will equal
15 over a million kilowatt hours, and again, the
16 number of pounds in the four areas, as indicated
17 below.

18 Considerations. One of the big
19 considerations for a company of our size and being
20 Qualcomm is future program development encouraging
21 energy savings. As Don mentioned earlier, they're
22 not out there aggressively marketing or
23 advertising the energy efficient programs.

24 For a company of our size it took us a
25 lot of digging and finding out and talking to a

1 lot of different people as to what programs were
2 available out there, what could we take benefit
3 of, and reduce pollution and increase our
4 efficiency and cost of operations.

5 The goals summary, again with this
6 building we're looking at installing a TES system,
7 and the thermal energy storage system, this 4008
8 square foot facility sits right next to a 200,000
9 square foot facility, and we're looking at putting
10 one thermal I storage facility in to support both
11 of the operations. And looking at, you know, how
12 do we quantify the amount of greenhouse gas
13 reduction based on off-peak times and on-peak
14 times is going to be the biggest challenge in
15 looking at the payback of this operation.

16 So kind of in conclusion, thanks for the
17 opportunity for being here today and sharing with
18 you what we, as Qualcomm, what we're doing through
19 our energy efficient programs.

20 (Applause.)

21 MR. SMITH: Thank you very much. That's
22 another example of the kinds of savings that are
23 possible, reductions in energy use, and the dollar
24 savings that go with them.

25 Our next speaker is Clay Hinkle. He

1 represents BF Goodrich Aerostructures Group in
2 Chula Vista. And Clay is their Environmental
3 Health and Safety Manager.

4 He's going to discuss BF Goodrich three-
5 part program to reduce energy use with an emphasis
6 on the behavior changes, process changes, and
7 retrofits.

8 Clay.

9 MR. HINKLE: I love this technology.
10 Actually this is pretty invisible compared to a
11 lot of presentations, I'm very impressed with it.
12 Although boot up for Windows95 is not always that
13 quick, is it?

14 Originally my boss was going to come
15 here and speak to discuss BF Goodrich's strategies
16 for mitigating global climate change. However,
17 she was taken away on an emergency, so I'm kind of
18 pinch-hitting, so you'll have to excuse me if it's
19 a little rougher than some of these other
20 presentations.

21 I've got to say, I have to agree with
22 the previous speaker. I've learned a lot so far
23 just listening to some of the bigger players in
24 this game, what they're doing.

25 This presentation's going to talk about

1 not every single thing that we've done to conserve
2 energy or everything that we're going to do. It's
3 going to kind of focus on a couple of items that
4 we've done and found that have been very
5 successful for us for various reasons.

6 But I'm going to talk about BF Goodrich
7 Aerostructures a little. We're part of the BF
8 Goodrich Company which is composed of two groups,
9 which is aerospace and chemical. And we're a
10 group within the aerospace, and we are one of the
11 leading independent manufacturers of the cells and
12 pylons and actually I believe we probably have a
13 customer from United Technologies, Pratt & Whitney
14 is one of our customers.

15 We have six locations that we are
16 currently active right now. The two locations
17 that I'm going to be talking about today are Chula
18 Vista and Riverside where we've had very active
19 programs in energy efficiency and other
20 environmentally responsible programs that do go a
21 ways in mitigating global climate change, in a
22 small way.

23 But as you can tell we even have
24 facilities overseas, and I can tell you from
25 visiting them that they are actually more advanced

1 in many ways than we are in how they handle their
2 programs of energy efficiency, recycling and
3 various other items. And I think they're leading
4 us in many ways as far as on an overall basis.

5 Chula Vista is our largest campus. It's
6 located near south of San Diego. It is over 200
7 acres and actually we're consolidating this campus
8 down to a smaller footprint which will, in return,
9 reduce energy consumption because we'll be heating
10 less square feet and cooling less square feet.

11 Where we excel in Chula Vista is we
12 built the detailed parts that go into making the
13 cells and the pylons, and we do the engine
14 buildup.

15 In Riverside, which is the other
16 facility we'll be talking about, it's our second
17 largest facility and its area of excellence is the
18 structure, it's metal bonding, which is a very
19 basically one of the high technology areas of the
20 aerospace industry. And they do a very good job
21 there. They also have had some very good
22 successes with their energy program there.

23 We have had some energy conservation
24 initiatives, lighting retrofit is one of them. I
25 hear a lot of people talking about it. We've been

1 very successful with that, with replacing the
2 lighting ballasts and replacing the emergency exit
3 signs and lights.

4 This has been maybe a small benefit in
5 the overall savings, but this is just an example
6 of how you just keep pecking away at it and you
7 eventually drive your energy bill down.

8 The next area is our -- in Chula Vista,
9 was our compressed air control system. We went
10 through and said that this is a big energy
11 consumer, and so what we did is went and found all
12 the leaks in the air compressor system and then we
13 repaired those leaks. And then we installed a
14 demand expander which allowed us to more
15 efficiently distribute the compressed air. And
16 then we converted to programmable controls which
17 allow us to maintain a pressure in a more
18 efficient manner. That was one of our big wins as
19 far as saving energy.

20 In Riverside, they had a big win in
21 their air conditioning control system. They found
22 that they were able to retrofit the air
23 conditioning system and they were able to create
24 more places to control it in order to shut it off
25 in areas where it wasn't in use, and increase the

1 awareness of the people using it. And that was
2 one of their big areas of savings.

3 The other area that they were very
4 successful at was they created an education
5 program where they went to the senior management
6 and said we want people to act responsibly with
7 energy use within this facility.

8 When I first went to that facility you
9 didn't walk out of a room without turning out the
10 light, making sure the heat was lowered. And it
11 was a culture there, it had become a culture
12 there. And I bring that up, it's because a lot of
13 behavior, just to change behavior can impact
14 energy use.

15 What we've done with that, and these are
16 just a couple examples from each facility of where
17 we've tried to approach energy savings, but what
18 we've achieved with that over the last ten years
19 is we've reduced our energy consumption by 30
20 percent.

21 And that's not by doing any big thing,
22 that's by doing a lot of little things. And these
23 are -- each one is a couple of examples of that.

24 We have these initiatives ongoing and
25 they need to have fresh air breathed into them on

1 occasion. But they are ongoing. And that will
2 mean that we'll have additional savings.

3 Other areas that we're currently
4 addressing that we obviously have a high
5 efficiency motor replacement. We have a lot of
6 motors, fans that we have in our facilities. And
7 every time we replace, repair, install a new one,
8 we obviously are always trying to put the most
9 efficient motor in there.

10 That goes with the boiler installation,
11 that we find that we've had a lot of energy
12 savings through buying the latest technology in
13 boiler technology.

14 Lessons learned. Energy conservation
15 site specific, and I think we've heard this theme
16 all along. We say it's company specific, I would
17 say it's maybe even individual specific. But it
18 is very site specific. What worked really well in
19 Riverside didn't necessarily, wasn't the same
20 winners that were in Chula Vista.

21 So, it is very site specific, and that's
22 the reason that as our first speaker had said,
23 what we really need is something that isn't
24 command and control, but incentivized programs
25 that allow individual decisions to be made at the

1 very lowest possible level.

2 And we did participate in several
3 incentive programs, and that got people off the
4 mark and got them started, and then they looked
5 for the next thing and the next thing. And
6 incentive programs do help. I think they even
7 could be increased in ways that would get even
8 more participation. I think there are several
9 ways to do that.

10 Success requires committed individuals.
11 At each one of these facilities we have a single
12 point person. And everything that goes through
13 there as far as repairing or adding new
14 facilities, goes through these people. And one of
15 their filters is energy conservation.

16 And each one of these people are very
17 committed to identify energy efficient approach to
18 whatever problem they're trying to solve. And
19 without these two individuals at each of these
20 facilities, these programs wouldn't have created
21 the success they have.

22 Future plans for energy conservation.
23 One of the things that we have a problem with, and
24 I haven't heard anyone speak of this, is we don't
25 have enough resolution in our metering. We meter

1 for a whole facility.

2 Well, if we really want people to act
3 responsibly, they've got to be metered down to a
4 much much finer resolution. That's not always a
5 simple process, but that's something we're looking
6 at, of how do we meter better so that we can
7 identify managers and hold them responsible for
8 their energy use even in a subfacility level.
9 That's how we can drive the consumption down.

10 One of the problems we've had is we have
11 tried to do estimations. This is one of those
12 failed experiments, where we estimate the energy
13 use from the managers. Say, okay, you're going to
14 be held accountable for that. But that, from a
15 human behavior point of view, doesn't work. They
16 need to see that meter running, they need to have
17 something they can verify. An engineer's
18 estimation, even if it's better than the meter, is
19 not going to really cut it.

20 So this is one of those programs to
21 bring accountability to managers to manage their
22 energy, we have to be able to measure. And then
23 we need to create the metrics that allow them to
24 feel like they're fairly being measured. One of
25 the things is this normalization of data. How do

1 you normalize it over sales, over units produced?
2 That's always the tricky part, and I think that's
3 another thing where no one answer is correct. But
4 maybe for our company we can come up with
5 something that might be perfectly appropriate for
6 us that wouldn't be for another.

7 We are going to need to reduce our
8 energy consumption of ovens and furnaces. The
9 problem with ovens and furnaces is that it almost
10 directly correlates to increase in demand for our
11 product. So we're going to have to look at
12 process changes, we're going to have to look at
13 real innovation here. It's not a simple thing of
14 not using the oven as much. Because that's our
15 business, that's how we deliver products to the
16 customer.

17 I think that a lot of people, depending
18 on the equipment they use to deliver products to
19 their customer, run into the same problem. This
20 is one where we will invest some R&D effort into
21 figuring out how we can do that better.

22 Other plans for greenhouse gas
23 mitigation. Again, this has been touched on.
24 Energy conservation is obviously a very important
25 thing for greenhouse gas mitigation, but there are

1 other means to do that.

2 One of the things is we have a master
3 site plan that is going to turn our basically
4 industrial complex into a much more park-like
5 setting. And that has obvious benefits for a lot
6 of reasons. But that's one of the things that we
7 do because it's the right thing to do for us to
8 move our company. But it has the added benefit of
9 mitigating greenhouse gas.

10 The next thing is we have an aggressive
11 solid waste recycling program, and we actually are
12 continuing and pushing the envelope on this one.
13 This is not a side issue, this is a main issue.
14 It reduces raw material consumption, which reduces
15 energy consumption at the front end of it, but it
16 also reduces landfill gas generation.

17 I don't know if you've looked at any
18 emission inventories of recent, but if you know
19 how much emissions come from landfills and how
20 long landfills continue to emit after they're
21 closed, this is one area that everyone should be
22 really committed to. Is in recycling and reducing
23 the amount of material that goes to the solid
24 waste, and to the landfill.

25 And that's it. I'd like to thank

1 everybody. This is a read education for me. And
2 I'm really looking forward to the dialogue this
3 afternoon.

4 (Applause.)

5 MR. SMITH: Thank you very much. I
6 think your comments about the importance of
7 reducing material going into landfill and
8 recycling are very well taken. Also, a 30 percent
9 reduction in energy usage is quite dramatic.

10 Our next speaker is David Hermance. He
11 is Executive Environmental Engineer at Toyota
12 Technical Center. Dave is responsible for
13 advanced technology vehicle communication for the
14 North American market, as well as for emission
15 certification and regulatory activities involving
16 new technologies.

17 Before coming to Toyota Mr. Hermance
18 served as the Department Head for Durability Test
19 Development at General Motors at their Milford,
20 Michigan proving ground.

21 MR. HERMANCE: Well, I see it's still
22 morning so I can say good morning, ladies and
23 gentlemen. And I have to start off with an
24 apology. I am Dave Hermance, I am the Executive
25 Engineer, and that's the apology part, of the

1 Environmental Engineering for Toyota's Technical
2 Center. I'm more used to speaking to groups of
3 engineers. I have tried to back out some of the
4 jargon that is part of any presentation that I do.
5 If I get carried away I'll probably be able to
6 tell because you'll start nodding off.

7 I also recognize I'm one of the last two
8 things interfering with you and lunch. So I will
9 attempt to be relatively timely in this.

10 I'm here today to provide you a little
11 bit of an overview of Toyota's efforts to improve
12 energy efficiency, both in the area of our
13 vehicles and because of specific request, because
14 we have some locations in California, to talk a
15 little bit about our operations and efficiencies
16 in California.

17 Toyota believes that there's no single
18 solution for the energy efficiency needs of the
19 future. There's no clear winner in the many
20 technologies for mobility in the next century. We
21 have committed research to a range of options,
22 ranging from everything from making our current
23 technology vehicles with gasoline and diesel more
24 efficient -- bear in mind we don't sell diesel in
25 the U.S., we do however sell it in other

1 markets -- to looking at alternative fuels like
2 compressed natural gas or LPG, to working on
3 several varieties of advanced technology vehicles
4 that feature electric drive systems.

5 These include both hybrid electric
6 vehicles, battery electric vehicles, and also fuel
7 cell electric vehicles, which on a long-term basis
8 we believe is the likely solution going forward.
9 The only question is how long is it going to take
10 to get there, and don't we need some enabling
11 technologies in the interim to get to that point.

12 Toyota has launched a program originally
13 in Japan, now expanded to the U.S., referred to as
14 the eco program, that was the title of the last
15 slide. But what's this thing eco mean? And
16 actually it turns out it means different things to
17 different people.

18 In California at least, partially it
19 means low criteria emissions. The smog formers
20 and the particulates. In the context of this
21 particular meeting it means low CO2 emissions from
22 the transportation sector.

23 If you're in Europe it means a very
24 highly recyclable vehicle. They have a big focus
25 on end-of-life recyclability. And if you happen

1 to live next door to a manufacturing facility, or
2 in the proximity of the footprint of the
3 manufacturing facility, it means low manufacturing
4 emissions for water, air quality and for wastes.

5 And Toyota is attempting to address all
6 of these. I will focus today primarily on the
7 first two of these.

8 Because we have to sell product to the
9 market, we have to pay some attention to what the
10 market wants. And what our market research
11 suggests, that is all other attributes being
12 equal, and that's pretty important, there's an
13 increasing awareness on the buying public's part,
14 they'd like to do the environmentally correct
15 thing.

16 But they're not willing to compromise
17 the attributes of their current transportation.
18 And we've been doing this for about 100 years now,
19 we've gotten fairly good at setting fairly high
20 expectations for personal mobility.

21 In large measure this explains, to an
22 extent, the niche market status, to date, anyway,
23 of battery electric vehicles and most of the
24 alternative fuel vehicles.

25 Now on a CO2 basis not all these

1 competing technologies are equivalent. Now you'll
2 note this chart refers to a test that you're
3 undoubtedly not familiar. This is the Japanese
4 1015 cycle. This is the Japanese certification
5 test. This chart was developed based upon
6 Japanese fuels production and Japanese driving
7 conditions.

8 I just last Friday got from Argon Labs
9 an equivalent version of this based on U.S. city
10 and highway average, and based on the U.S. market
11 of fuels. Next time I give this presentation I'll
12 have the benefit of that update. But the basic
13 shape of the story is the same. Is that there is
14 a wide range of CO2 reduction potential varying by
15 technology.

16 And one thing I would point out is that
17 some of the technologies depend a great deal on
18 how you make your energy. The battery electric
19 vehicle in those markets where there's a high
20 percentage of hydro or nuclear, if you get by with
21 the other constraints with nuclear, or if the
22 energy is generated outside the area of interest,
23 the CO2 emissions from electric vehicles look very
24 good.

25 If your fuel mix is highly coal biased,

1 actually the CO2 emissions of a battery electric
2 vehicle can be higher than the emissions of a
3 conventional technology vehicle. And that's
4 something that has to be monitored. Not all
5 solutions are best for individual locations, even
6 though we're talking about a global CO2 problem.

7 And in the case of a fuel cell, direct
8 hydrogen fuel cell shows far and away the best
9 promise for a reduction in CO2 gases. You lose
10 some of that benefit if you reform methanol on
11 board, and you lose a bigger chunk of it if you
12 reform gasoline on board. Gasoline does, however,
13 have the advantage of having a widely established
14 infrastructure.

15 So there are a number of tradeoffs that
16 have to be made in the development of these new
17 technologies, all of them trying to satisfy the
18 customer's demand.

19 So we've developed a system we believe
20 is a very viable transitional technology. The
21 previous slide had showed significant reductions
22 in greenhouse gases and we're going to talk a
23 little bit about it, and you'll see it before a
24 great deal more time passes.

25 Driving the development of this new

1 technology, hybrid gasoline/electric vehicle, was
2 a significant increase in fuel economy over
3 conventional technology gasoline vehicles. A
4 significant reduction in exhaust emissions because
5 many of the areas in which we sell product are
6 very sensitive to criteria pollutants and
7 particulates.

8 In order to satisfy the customer's
9 demands it needs to have a smooth and responsive
10 power train, otherwise the market will reject it.

11 Also to satisfy at least the near-term
12 demand of the customer it is better from an
13 acceptability standpoint to use an existing
14 infrastructure. So this vehicle refuels with
15 gasoline only, does not plug into recharge, does
16 not use an alternative fuel.

17 And one other point that's important,
18 and I see Jim in the front row here, he and I have
19 talked about this before in a former life he had,
20 and in a former position I had, that clean
21 technology, no matter how good it is, if you can't
22 sell it in volume, has no impact on air quality,
23 either from a CO2 basis or from a criteria
24 emissions basis. So you've got to come up, at
25 least initially, with something that's competitive

1 from a pricing standpoint, or you might as well
2 forget it.

3 So what have we got? This is a brand
4 new vehicle. And you'll see, if you look
5 closely -- those of you with very good eyes or
6 close to the screen -- you'll see the steering
7 wheel is now on the left side. We showed this
8 vehicle in this country almost two years ago at an
9 event in Florida in the right-hand drive
10 configuration, which is the first embodiment of
11 the technology. This vehicle's been on sale in
12 Japan since December of '97.

13 And one of the first classic complaints
14 was, the steering wheel's on the wrong side. And
15 you should please note that we were responsive to
16 that market demand --

17 (Laughter.)

18 MR. HERMANCE: -- and moved the steering
19 wheel to the other side.

20 This vehicle will come to market soon,
21 and I will talk a little bit more about it. In
22 some other forum you might get an opportunity to
23 drive the vehicle, but unfortunately I didn't
24 bring one today. I do apologize about that.

25 These are the basic specifications of

1 the vehicle. It is an all-new, compact class,
2 passenger vehicle. It has a relatively long wheel
3 base, but a short overall length. This results in
4 a vehicle that's smaller on the exterior and
5 bigger on the interior.

6 The vehicle has better passenger
7 compartment room than Corolla, it's primary
8 competitor, at least in our product line, but it's
9 significantly shorter overall than Corolla. This
10 is an all-steel vehicle, so it still have a
11 relatively high curb weight. It is a relatively,
12 but not dramatically, aerodynamic vehicle. It's a
13 little bit on the tall side for ease of entry and
14 exit. And it prevents us getting the drag
15 coefficient down to very low numbers.

16 So it's a conventional technology
17 vehicle from a structure standpoint, with some
18 very unconventional drivetrain issues.

19 Now, I promise not to dwell on this, but
20 I couldn't pass up putting in at least a little
21 bit of the technology. Obviously this is the
22 engine. And this area where ordinarily your
23 automatic transmission would reside, we have a new
24 device. This is the hybridization of the vehicle.
25 The outboard device we refer to as the motor. The

1 inboard device we refer to as the generator.
2 There are two electrical machines in the space
3 ordinarily taken up by the automatic transmission.
4 And there's one planetary gear.

5 There are no clutches or bands in the
6 transmission. There are no wear components in the
7 system. There's no clutch to disconnect the
8 engine. All of the transmission effect is
9 accomplished with these two electrical machines
10 and one planetary gear, all in direct combination.

11 This winds up in a very robust, from a
12 reliability standpoint system. It will never need
13 to go to Amoco to get the clutches replaced long
14 into its future life. These machines are three-
15 phase, AC, permanent magnet machines. There is an
16 invertor that sits directly on top of this unit
17 installed in the vehicle. And there is a small
18 battery pack that sits behind the rear seat in
19 this vehicle.

20 Now, hybridization has some very
21 interesting attributes. We're going to make it
22 somewhat interesting to try to explain to the
23 customers. This technology gets better relative
24 fuel economy the nastier drive that you
25 experience.

1 In the Japan market the 1015 mode is a
2 congested city drive cycle. It's twice as
3 efficient as a gasoline vehicle. If you live in
4 downtown Tokyo and drive in a traffic jam that I
5 wouldn't want to participate in at an average
6 speed of only about 7.5 miles an hour, it gets 2.2
7 times the fuel economy.

8 And a test more familiar to us in the
9 U.S., the U.S. city test, the Japan market vehicle
10 is 60 percent more efficient than a comparable
11 technology gasoline vehicle. In fact, the U.S.
12 market vehicle is about 80 percent more efficient
13 on that drive cycle. We did a little tweaking.

14 And on the highway test it's only about
15 15 to 20 percent more efficient. The advantages
16 of hybridization are principally in congested city
17 driving. The reason for that is we shut the
18 engine off at very low speeds, stop and go, it's
19 off at idle, it's off for the initial launch, it's
20 off in all the times a gasoline engine is
21 inefficient. That contributes to improved city
22 efficiency. Doesn't help a darn bit on the
23 highway.

24 It uses regenerative braking. That
25 helps in the city stop-and-go type driving.

1 Doesn't help on the highway. It uses an
2 optimization through that unique transmission to
3 maintain the engine at a most efficient operating
4 point.

5 Well, we do a pretty good job of
6 maintaining engines at efficient operating points
7 on conventional technology vehicles, so there's
8 not a big gain there.

9 The one gain this particular vehicle has
10 over a conventional technology vehicle on the
11 highway is because of the hybridization we can use
12 a more efficient engine. We use a combustion
13 cycle called the Atkinson cycle that is 15 to 20
14 percent more efficient than the conventional
15 gasoline vehicle.

16 The reason we don't use that technology
17 on a conventional vehicle is it takes a bigger
18 engine to get the same level of power. So it's a
19 high specific power, low specific -- or high
20 specific efficiency, low specific power type
21 engine. Can't use it without a hybridization.

22 Well, some of you may have seen some
23 press material about the vehicle that's on sale in
24 Japan. I'm going to tell you a little bit about
25 what's coming for the North American market. It

1 will begin production in May of 2000 to go on sale
2 very shortly after that, as soon as the boats can
3 get here.

4 It will be an SULEV, a super ultra low
5 emission vehicle. It will have improved fuel
6 economy, as I've already alluded to, over North
7 American type driving profiles. It will have
8 improved drive performance. The vehicle was a
9 little bit slow for the U.S. market as released to
10 the Japan market. And we've improved that.

11 And I need to be careful about how you
12 read this. That is a cost reduction, not a price
13 reduction. It was fairly widely reported we were
14 losing money on this technology when it was first
15 introduced, and that was accurate. We needed to
16 take cost out of the product in order to get to a
17 more competitive position at the price point. And
18 we've done that.

19 It won't be reflected in a huge price
20 reduction but we'll be able to keep building them
21 because we're not losing money on every one of
22 them.

23 Just for reference these are the
24 emission standards associated with the recently
25 adopted SULEV requirement, and 120,000 mile

1 durability requirement. As a point of reference,
2 the cleanest vehicles certified today are
3 certified at the original ULEV category.

4 This vehicle is approximately 90 percent
5 cleaner than those vehicles, which are already
6 very clean. It's actually arguably more than 90
7 percent cleaner, because it has 120,000 mile
8 durability requirement as opposed to the older
9 100,000 mile durability requirement. We've also
10 made changes to adopt the other regulations that
11 are present in California.

12 The U.S. market vehicle, we're not quite
13 finished with the development yet, but the first
14 generation prototypes that we've reviewed with the
15 press and are out running around in the demo
16 program now, have returned 55 miles per gallon,
17 city/highway combined numbers.

18 Now, this is what's referred to as the
19 CAFE number. That's not the label value. The
20 label values are depreciated by EPA and we haven't
21 run the cert vehicles yet, so I don't know exactly
22 what those are.

23 But for reference, the '99 model Corolla
24 automatic transmission is a 38 mile per gallon
25 vehicle. The Corolla is also the best in class

1 compact car in the '99 product line. So this is a
2 rather remarkable improvement with a comparable
3 level of functionality for the customer.

4 Now, to another subject. Many of these
5 things you have seen on previous presenters'
6 slides, these are fairly normal things to do to
7 improve your energy efficiency. These class of
8 improvements are common across most of Toyota's
9 operations in North America.

10 These are in the general category of
11 energy conservation, energy user reduction.
12 Toyota, at least in southern California, has gone
13 one step beyond that. In April of '97 the
14 southern California Toyota Group Companies signed
15 the largest renewable energy contract in the
16 world.

17 Toyota Group Companies buy approximately
18 39,000 megawatt hours of renewable energy every
19 year. Based on data from the energy provider,
20 this is an air quality improvement, a benefit, and
21 avoidance, if you will, of significant quantities
22 of criteria pollutants, and slightly less than
23 16,000 tons per year reduction of CO2 emissions by
24 using renewables.

25 This is easier to do for the campuses in

1 southern California because they are the sales
2 organization and they can derive some PR benefit
3 from this. As was previously noticed, green
4 energy is somewhat more expensive. It's a little
5 tougher sell in the manufacturing environment
6 where you're absolutely audited to the last, you
7 know, penny you put into the vehicle. But this is
8 the direction that we can go.

9 And one last slide to try to keep us on
10 time. Toyota has sold slightly more than 30,000
11 of the Prius vehicles since it's launch in Japan
12 in '97. And although that number is small,
13 compared to our sales of Camry, it's huge compared
14 to the sales of all other advanced clean
15 technology vehicles, either in Japan or in any
16 other market.

17 The manufacturers alone aren't going to
18 decide what sells in the future. Only the market
19 will make that decision. And it's not yet clear
20 what's going to happen.

21 We believe that hybrid vehicles
22 represent a very viable transitional technology
23 for the automobile toward the future of fuel
24 cells. They implement significant elements of
25 electric drive systems which will be critical for a

1 fuel cell vehicle future, and allow us to learn
2 down the cost of those systems prior to the
3 availability of reasonable cost fuel cell systems.

4 We realize we have an impact on the
5 environment and Toyota is definitely striving to
6 reduce the environmental impact, both of our
7 vehicles and of our facilities.

8 Thank you.

9 (Applause.)

10 MR. SMITH: Thank you, David. I think
11 this was interesting not only from the standpoint
12 of policy and technology, but interesting to us as
13 consumers, as well. Looking forward to spring.

14 Our next speaker is Patrick Healy.
15 Patrick began working for Fetzer Vineyards in
16 1976, and had the enviable job of Tasting Room
17 Manager for quite a number of years.

18 In 1994 Mr. Healy was appointed as
19 Purchasing and Environmental Manager, and became
20 the Environmental Programs Coordinator in 1999.
21 He oversees Fetzer's waste reduction, recycling,
22 energy efficiency and the employee and community
23 education programs.

24 He will discuss Fetzer's history of
25 involvement in environmentally sound practices and

1 the company's recent innovations including
2 purchasing and incorporating renewable power in
3 its operations.

4 Patrick.

5 MR. HEALY: No one's told a joke yet
6 today. So, we're at lunch, but I'll tell one
7 quick little joke somebody told me the other day
8 that I thought was kind of cute.

9 Do you know what a midget psychic on a
10 lamb is called? A small, medium and large.

11 (Laughter.)

12 MR. HEALY: Well, okay, it's a little
13 weak, but the only thing that ties into is that
14 we're the smallest company represented here. And
15 I realize I've brought the wrong presentation,
16 also. Anyway, so I will sort of run around this
17 presentation.

18 We're located in Mendocino County which
19 is about 110 miles north of San Francisco. In
20 southern Mendocino County, we make about 3.5
21 million cases of wine, so we're fairly conspicuous
22 in the marketplace. I think we're the sixth
23 largest winery in the United States.

24 We have been going green for quite some
25 time. Our mission statement speaks about the

1 environment. Our sustainability statement speaks
2 about the environment. I think that's the only
3 time this work has come up this morning,
4 sustainability.

5 On my handy keychain here I have our
6 sustainability statement. And it's, "We challenge
7 ourselves to act in ways that benefit the people
8 with whom we work, support the communities in
9 which we do business, protect and sustain the
10 environment, and achieve exceptional financial
11 returns."

12 So, to stay in business you've got to
13 achieve exception financial returns. And we think
14 you can do that and also be environmentally sound.

15 We started farming organically,
16 converting our vineyards to organically farmed in
17 1986. So now all 700 acres of the grapes that we
18 grow are farmed organically which means we don't
19 use any pesticides. There's an area there that
20 we're trying to address with our CO2 reduction,
21 and that when you farm organically you use
22 tractors a little more because the weeds aren't
23 killed everywhere, so you have to use a little
24 more tractor.

25 We're trying to become more efficient

1 with our tractor usage, do a little more mowing in
2 our vineyards so we don't have to use as much
3 fuel. We've achieved 93 percent reduction in our
4 recycling efforts. We bought a garbage truck in
5 1989. And in 1990 we established a base year so
6 we knew exactly how much we were taking to the
7 landfill. We took 1724 cubic yards to the
8 landfill that year, and last year we took 119. So
9 our goal there is zero waste by 2010, which means
10 12 cubic yards reduction every year. And I think
11 I'll be retired before then, so good luck on that
12 one.

13 (Laughter.)

14 MR. HEALY: We have a green building for
15 our administration building. It has dirt walls,
16 all recycled wood; has a 40 kilowatt photovoltaic
17 display on the south-facing roof. It's the
18 largest photovoltaic display in northern
19 California by a nonutility.

20 That was a pretty unique building. The
21 photovoltaics, because we did that and also
22 purchased green power, we received a climatewise
23 partnership award, as did Ravi, at the climatewise
24 workshop in November.

25 We have a small cogeneration plant, a 75

1 kW cogeneration plant which we use to make
2 electricity and heat water for our barrel washing
3 operation. And that's run off natural gas.

4 We have a 150,000 case label of organic
5 wines which we call bon terra. You won't see
6 Fetzer on the label. It just says bon terra. For
7 marketing reasons, the marketing people don't feel
8 like they want to confuse the public by putting
9 Fetzer on there.

10 The reed bed project, we sponsored a
11 study by a doctoral candidate from UC Davis who
12 studied our water for four years. Because winery
13 water is pretty unique; it has real high
14 biological loads. And we planted the reed beds
15 and we're treating our water naturally this way.
16 And the water from the reed beds, after it's
17 treated, goes back out to the vineyards to water
18 the vineyards.

19 So we have fairly aggressive goals in
20 all areas. We have a 25 percent reduction in
21 energy over the next two years. Because we bought
22 renewable power, which comes at a premium, as
23 everybody's saying, we're going to more than back
24 off that money load that we're assuming by energy
25 efficient measures, and it's amazing what energy

1 efficient measures you can find when you really
2 begin to look. And they're there. They do
3 require some capital money, but if you can show a
4 quick payback you can get those sort of things.

5 We have a 30 percent reduction in our
6 water usage over the next three years, and we have
7 a zero waste reduction, or zero waste by 2010,
8 which our CEO says is too modest. He'd rather see
9 it by 2005. So you can see where our -- it's from
10 the top down in our organization, in our
11 corporation. And you need that sort of support,
12 as everyone has said here, you need to come from
13 the top down.

14 The rest of this was about purchasing
15 green energy. And I don't think we need to go
16 over that.

17 Some of the things we're doing in the
18 future are Natural Logic, which is a company that
19 does evaluations of your company's CO2 and other
20 emissions. It's being sponsored by the EPA and
21 business for social responsibility. And they're
22 coming and within the next three months we'll have
23 an accurate assessment of all our CO2 emissions
24 from our trucking fleet to our tractor fleet to
25 other uses.

1 We've become 9001 certified. We're
2 working on 14001 certification now. For the
3 European market that's pretty important. And we'd
4 like to increase our solar power usage. In fact,
5 our goal at one point, which I think has been
6 revised, although it's still in the hearts of
7 some, is to be totally off the grid by 2015.

8 And to do that I guess we'd have to get
9 into partnership with BP Amoco and --

10 MR. McADAMS: We'd be delighted to help
11 you.

12 (Laughter.)

13 MR. HEALY: -- and the California Energy
14 Commission, which without the grant from the
15 California Energy Commission we wouldn't have done
16 the photovoltaics. So I hope they keep supporting
17 alternative energies. And I use information from
18 the California Energy Commission quite a bit in my
19 research.

20 And it's lunchtime. Thank you.

21 (Laughter.)

22 (Applause.)

23 MR. SMITH: Thank you, Patrick. We do
24 appreciate the partnership that we have with your
25 firm. The idea of achieving exceptional returns

1 with environmentally sound means is probably a
2 nice way to close here, take away that thought for
3 lunch.

4 For those of us at the Energy Commission
5 in Sacramento, the lunch opportunities include a
6 snack bar on our second floor. It's up the
7 staircase just outside. Also in the foyer there's
8 a list of nearby restaurants and directions.
9 Staff there can help you.

10 Our intention is to begin at 12:45 with
11 Judy Pike from Bentley/Mills. And we'll begin
12 then. Thank you very much.

13 (Whereupon, at 11:35 a.m., the workshop
14 was adjourned, to reconvene at 12:45
15 p.m., this same day.)

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1 AFTERNOON SESSION

2 12:48 p.m.

3 MR. SMITH: The first speaker will be
4 Judy Pike. Ms. Pike is currently West Coast
5 Representative for Supply Chain Management for
6 Bentley Mills, that's an Interface company located
7 in the City of Industry in southern California.

8 During her six years with the flooring
9 company she has helped develop the recycling
10 program that reduced the company's landfill
11 contributions by 73 percent. She was also the
12 driving force behind Bentley's being selected as a
13 1999 recipient of the State of California's waste
14 reduction awards program.

15 Before coming to Bentley Mills, Ms. Pike
16 spent 16 years in the aerospace industry. She'll
17 talk about the Interface's corporate policies in
18 reducing greenhouse gases from the products they
19 manufacture, which are highly dependent on
20 petrochemicals. And she'll be talking about the
21 company's voluntary goals for achieving
22 sustainability and restoration of natural systems.

23 MS. PIKE: Thank you for that
24 introduction. It was suggested that since I was
25 the first speaker after lunch that I should start

1 with a song and a dance, but I think I won't.

2 (Laughter.)

3 MS. PIKE: And I'd also ask you to not
4 be too technical with me, that's not my expertise.
5 My expertise is what we call hooking it up, and
6 I'll get to that in a little bit.

7 I'm going to read to you just an excerpt
8 from Interface Research Corporation. And it's
9 talking about not just Bentley, it's talking about
10 Interface, who is our parent company.

11 At Interface we're concerned about all
12 activities that destroy natural systems. Although
13 we're a very small contributor to the buildup of
14 greenhouse gases, we believe that it's essential
15 for us to take responsibility for our contribution
16 and we have voluntarily committed to reduce our
17 impact.

18 The majority of our emissions are the
19 result of the energy consumed in the manufacturing
20 process. We have declared that all nonrenewable
21 energy consumed in our processes are considered
22 waste.

23 Okay, and with that, Bentley Mills is a
24 commercial carpet company. We're located in
25 southern California, around L.A. And we are part

1 of the Interface Corporation. That's our logo,
2 Interface logo up there in the upper corner.

3 Bentley has -- I think we're the
4 smallest company -- but Interface, as a whole, we
5 have about 6000 employees. We are global. And
6 Bentley has 550 employees.

7 This statement, Mr. Ray Anderson, who is
8 the Chairman of Interface, Inc., and the founder
9 of Interface, he's our vision, he's our driving
10 force, and he's the reason why we have become an
11 environmental company.

12 We talk about sustainability a lot, and
13 since someone else mentioned sustainability and
14 said it hadn't been mentioned, that is the most
15 buzz word that we have within our corporation, is
16 sustainability.

17 And frequently we're asked, whenever
18 we're speaking with community organizations or the
19 schools, just what does sustainability mean. It
20 means a lot of things, but this is the meaning
21 that we've chosen to define what we're talking
22 about with sustainability.

23 And then the next question is so how do
24 you become sustainable. This is our model. We
25 are going to go through the how-to's. We're not

1 going to be talking a lot about the technical ends
2 of all the things that we do, or the details. We
3 feel that the seven steps will take us to
4 sustainability if we do it right.

5 I'm going to quickly go through each of
6 these with you, and hopefully you'll see how this
7 all ties with the greenhouse gases and the other
8 subjects that we've talked about today with
9 climate changing.

10 And eliminating waste is our primary
11 issue. We call it Quest. It's team-based. Teams
12 are created by any employees within the company.
13 It can be a department manager, it can be a front-
14 line employee. We've had a huge amount of success
15 throughout the corporation in Quest.

16 At Bentley specifically, one of our
17 water reduction projects had to do with an
18 employee saying that this, we're using way too
19 much water in this dye process. If we did this a
20 little bit differently then we could make a big
21 difference.

22 Also, the lighting retrofit that we did
23 in our building, which has already been mentioned
24 by someone who's been at our building, knows that
25 it's way out of line. It's an old building that

1 we're in. Was our quality people saying on the
2 front line, this light is not good enough, and not
3 consistent enough here as it is in the early part
4 of the manufacturing process.

5 So, we've changed all of our lighting
6 and now we have a new building that has also
7 skylighting, as well as sensors and other things
8 that others had mentioned about lighting.

9 Quest is also zero based. We're not
10 talking about reducing waste, we're talking about
11 eliminating waste. And we've defined waste as
12 anything that doesn't add value to our customer.

13 We measure everything. We measure our
14 energy consumption. We measure our raw material
15 that we take, that we make, that we waste. And we
16 report that on a quarterly basis. It's printed in
17 our statements, our financial statements, and it's
18 part of all of our marketing material, as well.

19 The bonus system is how well we do at
20 Quest and the other waste reduction programs.
21 It's not only beneficial at the management level,
22 but it's also beneficial at the front-line
23 employee level.

24 Not all of our companies, I think we
25 have 61 companies in the Interface family, not all

1 of our companies' programs are the same, but in
2 every company there is a payback for having our
3 Quest numbers be what we need them to be.

4 One of our companies last year, every
5 employee received \$1460 I believe it was at the
6 end of the year.

7 Because we are a global company and we
8 have several sites in the United States, as well
9 as in Europe and Asia, we have to do a lot of
10 networking. And we depend on each other to help
11 us improve in those areas.

12 So number two is the nonemissions. Some
13 of these problems and solutions that we've listed
14 here, obviously simplified for this group, and we
15 don't really need to go into a lot of detail in
16 them, but here we're talking about not just solid
17 waste, we're talking about the molecular waste,
18 the CO2s, the global climate changes.

19 We call those smoke stacks. Ray
20 Anderson counts smoke stacks, all of our
21 emissions. He has a war against smoke stacks. So
22 every pipe that we're able to eliminate at the
23 source, not just counting or reducing the CO2s,
24 but every site, every pipe or smoke stack that
25 we're able to reduce that's a brownie point for

1 us. So we go after those just to please the top
2 guy. Well, not just to please the top guy, but
3 that's one of the things we want to do.

4 And we're not just talking about
5 hazardous waste. Bentley specifically doesn't
6 have any hazardous waste. We're a relatively
7 small company in the scheme of the whole
8 corporation, but Bentley specifically, we have 54
9 stacks. We've eliminated 13 and we have one
10 that's neutral at this point. So we're not there,
11 we still have a long way to go.

12 Our carpet is made by nylon, 6.6 nylon,
13 very high grade of nylon. So we're pumping oil
14 out of the ground all of the time. So far the
15 technology doesn't exist for us to make the type
16 of carpet that our customers would buy from
17 anything other than that highest grade of nylon.
18 We would very much like to not make it from that,
19 but that's what we have.

20 So to offset that we focus on using less
21 energy, and focus on making that less energy the
22 energy that is left after we reduced, as renewable
23 energy.

24 In Europe, some of our European
25 countries have wind power. They also have small

1 solar plants. We have a couple of other small
2 solar plants in the United States. But at Bentley
3 in southern California versus northern California
4 we have a 100 kilowatt photovoltaic array. We're
5 very proud of that, cost us a lot of money. It's
6 not going to have a good payback, but we know it's
7 the right thing to do. And we want to continue to
8 do the right thing to do.

9 We also have a charge at Bentley that by
10 the year 2000 we want to be 100 percent green
11 energy. Right now our 100,000 kilowatt is only
12 about 6 percent of our daily consumption, average
13 daily consumption. We purchase another 13 to 15
14 percent of green energy. We want to make that 100
15 percent. And we're willing to pay for it. We
16 just have to find a way to pay for it.

17 Now we're talking about products.
18 Again, our product is made from nylon, our basic
19 products. Some of the other companies are doing
20 other things. And it is not recyclable. So the
21 product that we make is not only not made from
22 anything recyclable for the most part, it is not
23 recyclable when we're finished with it.

24 But we're doing lots of research. And
25 we do have products that we're working on that are

1 climate neutral. There may be more information
2 available about that. If there's anyone here
3 that's more interested in the climate neutral
4 products I'll be happy to hook you up with the
5 person that can speak better about them.

6 It is a goal of ours, that's what
7 Interface Research Corporation, one of our
8 nonprofit companies, is located in Kennesaw,
9 Georgia, that's their function. Their function is
10 to find new products, new ways, new processes
11 where we can make products that can be recycled at
12 their end.

13 Again, with all the locations that we
14 have, we do a lot of moving things around, moving
15 people around. We're trying to focus on less
16 moving of people and things, and more on moving
17 ideas and sharing those ideas.

18 So we have -- we've done all the normal
19 things that everyone else does too, like making
20 sure that all of our truckloads, when we ship by
21 truck, are full and not half empty. And shipping
22 by rail whenever we can. And that sort of thing.
23 But we also are talking about electronic
24 information. We have a global network. We're
25 hooked into all of our companies, we're on the

1 same computer base, so we talk to each other
2 daily.

3 We also have in the majority of our
4 manufacturing facilities we have
5 videoconferencing. So we've cut down our
6 transportation, our trips, our business trips a
7 considerable amount. At Bentley we used to do
8 \$120,000 a month in air travel. And last month it
9 was \$38,000.

10 So there are other things that are
11 involved with that number, too. That's not just
12 all the wonderful projects that we've done, but
13 there's some restructuring as well. But it's
14 definitely a concentrated effort for us to not
15 move people around, to move ideas.

16 This is my area of expertise. Within
17 our corporation we feel it is our responsibility
18 to create a community around us that shares the
19 same visions that we do; that understands natural
20 systems and understands the impact that people
21 have on natural systems.

22 We're very involved in our local school
23 systems. We are primary partners in a number of
24 community organizations. One of our finest hours
25 have been with a local high school that has

1 created a corporation that we mentor and we help
2 and advise them on. And that high school is now
3 teaching the elementary schools in their area all
4 about sustainability and about recycling. And all
5 of the other projects that we work on.

6 They're in our facility, probably
7 there's a classroom there at least once a month.
8 They help us with some of our more fun projects
9 like dumpster diving, which is where we analyze
10 our trash. We dump trash out, take a look at it,
11 analyze it, report the numbers.

12 And they also, this year, are going to be
13 using one of our consultants, Daniel Quinn's book,
14 Ismael, as part of their English classroom
15 assignments for seniors this year.

16 And here's the seventh step. Again
17 we're talking about focusing on value and service
18 for our customers, instead of selling stuff. WE
19 have what's called an evergreen lease, where we
20 manufacture the carpet. We deliver the carpet.
21 We are always responsible for it. We maintain it,
22 they pay us a monthly fee, our customers pay us a
23 monthly fee. And when that life of that carpet is
24 over with, it's still ours. It returns back to us
25 and we are responsible for disposing of it, or

1 recycling it, or taking care of however we have to
2 take care of the end-life of those products.

3 That's an expensive process. And it's
4 difficult at times to convince our customers that
5 it is really value we're selling them. They're
6 used to being able to go down sometimes to the
7 corner and getting a very reasonable piece of
8 carpet. And we're talking about selling the
9 service and the value of the carpet, and being
10 responsible for its disposal.

11 We're also talking here about changing
12 laws. We're talking about taxing things that are
13 bad, like pollution and waste, instead of taxing
14 the good stuff like income and savings and capital
15 gains. And we hope to have influence in those
16 areas with other businesses, as well as
17 governmental leaders.

18 And we know that if we can get it right,
19 that our results will validate all the things that
20 we've said. Again, these figures are a little bit
21 old. It's the first quarter of '99. We're over a
22 billion dollars, we're closer to \$1 billion in
23 sales, as far as the corporation is concerned. So
24 we're not a huge corporation.

25 And I believe the last figure I heard as

1 far as our Quest savings is \$76 million. That has
2 to do with all of our products we talked about in
3 the very beginning, eliminating the waste. It
4 also has to do with some of our green projects,
5 like our voltaics and other machines.

6 We also think with hooking it up that
7 we're creating enthusiastic employees and
8 customers and other businesses, and our suppliers
9 are involved in this. We challenged them, as
10 well, to show us how much embodied energy it takes
11 to get your product to us. It doesn't just stop
12 with us. We take it on through the supply chain.

13 And, again, if we do it right, we will
14 lead by example, and validate by results, leaving
15 the world a better place than when we began.

16 And it's not sustainability, it's not
17 just about charity or philanthropy, it's about
18 survival. It's about personal choices, what you
19 do, what you buy, what you make. And it's about
20 delivering superior value to our customers.

21 And I heard someone else say this, and
22 we use this all the time. Doing well by doing
23 good.

24 Thank you. We don't have time for
25 questions.

1 (Applause.)

2 MR. SMITH: Thank you very much. I
3 think that the holistic approach to cost
4 effectiveness and the value sense that Bentley
5 Mills has incorporated is something that we'd all
6 benefit from if it were quite widespread.

7 The next speaker is Jerry Schoening.
8 He's the General Manager of Global Environmental
9 Safety and Health for Applied Materials. For 16
10 years he's headed the environmental safety and
11 health organization at Applied.

12 He's been active in many environmental
13 safety and health programs in the semiconductor
14 industry. Participates in a number of
15 associations and consortiums. He's going to focus
16 a little bit on the specific kinds of challenges
17 in the semiconductor industry.

18 And I'll turn it over to you, Jerry.

19 MR. SCHOENING: Good afternoon. I'd
20 like to thank the California Energy Commission for
21 giving me this opportunity to speak to you today.

22 First, about Applied Materials, for
23 those of you who are not familiar with our
24 company, we are a Fortune 500 company, with about
25 14,000 employees right now and growing. And

1 operate in 13 countries. Our revenues last year
2 were almost \$5 billion. And a significant amount,
3 over 10 percent, invested in R&D. And that is
4 typically our pattern.

5 We are the largest producer in the world
6 of wafer processing equipment for the
7 semiconductor industry. And we make possible the
8 advanced microchips and display technologies that
9 are revolutionizing life on earth.

10 Our major customers are companies like
11 IBM, who spoke earlier; Intel, Motorola, TI and
12 many foreign companies, as well. And what we like
13 to say is that we make the systems that make the
14 chips that make the products that change the
15 world.

16 So what we're talking about here is the
17 capital equipment, the machines that go in the
18 factories, that end up to make the microchips that
19 go in your computers and your hand-held pc's and
20 all these kinds of things.

21 So our major customers, as I said, are
22 like IBM, Intel, and so forth. And a key
23 difference between some of the companies that have
24 spoken earlier today, and what Applied Materials'
25 impact on the environment is that our impact is

1 really through our customers.

2 Our customers use our equipment to
3 process semiconductors, and in that process they
4 use PFC gases which create the global warming
5 problem that we're trying to solve.

6 So our key business concept is that we
7 want to provide our customers with a total
8 solution. When we sell them a piece of equipment
9 we also want to tell them, as part of that
10 equipment, the environmental solution that they
11 need to go along with that.

12 In order to do that we have a strategy.
13 First of all, we need to organize. And that
14 includes top management support, and providing
15 dedicated and focused resources to solve these
16 problems. I'm going to talk about each of these
17 in detail.

18 Secondly, we need to identify the
19 potential problem sources. We need to prioritize,
20 then implement and bring viable solutions to the
21 marketplace, and measure the results and provide
22 feedback.

23 Our top management has been very much in
24 support of environmental safety and health issues
25 for a long time. I've been with the company for

1 16 years and it's always been a top priority.

2 With regards to the global warming
3 issues, this is a policy which was initiated
4 several years ago, and you can see that it is a
5 policy of Applied Materials to reduce these PFC
6 global warming gases. And we have got top
7 management support across the company to do that.

8 Part of the way that this has been
9 implemented then, in the way of organization, is
10 that in 1997 we created a small task force called
11 Green Initiative. And the objective of this task
12 force was to set a new direction for our products
13 and product development to create these total
14 solutions that I mentioned earlier.

15 The accomplishments were to create
16 awareness in the product development
17 organizations, provide measurement methods,
18 standards, and metrics throughout the company.
19 Provide ways of modeling our products so that we
20 could determine the value of what we're doing, the
21 cost versus the environmental impacts. And
22 communicate that within the company and also to
23 our customers.

24 And also to develop technologies such as
25 abatement technology, measurement of emissions and

1 so forth.

2 Once that was done in 1999, we disbanded
3 the green initiative and changed the format and
4 now we have what we call the environmental
5 solutions products division, which is focusing on
6 total solutions products, point of use
7 applications for our customers, integration of our
8 systems with the customers' systems, and
9 minimizing the total cost or maximizing the
10 environmental value for our customers.

11 In the process I mentioned we need to
12 identify the key issues. Now, for us the key
13 issue here is global warming gases. And
14 particularly PFCs, perfluorocompounds. And what
15 we found is that in the semiconductor fabrication
16 business only 4 percent of global warming gases
17 are attributable to the semiconductor fabrication.

18 The PFC emissions from the whole
19 semiconductor process is half of the total PFCs,
20 and the global warming emissions from electrical
21 power consumption by semiconductor production
22 factories is about 2 percent.

23 So we know where the problem is and what
24 we're going to focus here on is the PFC, the
25 emissions. And I want to show you why it's

1 important that we're focusing in this particular
2 thing.

3 If you look at the typical PFC gases
4 that are used in semiconductor production, most of
5 the people today we're talking about reduction of
6 energy, and that really amounts to reduction of
7 the emission of CO2 or CO, which has a global
8 warming potential of 1 as an index.

9 If you look at the impact of such gases
10 as CF4, it has a lifetime of 50,000 years. Or
11 SF6, which has a global warming potential of
12 23,900 as opposed to right here, 1. You can see
13 why it's extremely important that we focus on
14 these gases.

15 So once we'd identified that, we looked
16 at our internal processes that we sell to our
17 customers. And we have normalized this so we can
18 talk about it in terms of the impact per wafer
19 that is processed by our customers.

20 So what we can see here is that the
21 total impact, which is converted to carbon
22 equivalents here, which is a common metric used in
23 the industry, we started out with greater than 500
24 kilograms of carbon equivalent per wafer before we
25 did anything.

1 The majority of this was caused by our
2 CVD processes, our etch processes, a smaller
3 amount, and then the electrical component of our
4 equipment, about one-fourth. So we knew where to
5 focus our activities.

6 We took separate approaches on each of
7 these. This is the implementation phase. For the
8 CVD processes, we had to invent a new technology.
9 And I'm going to say a little bit more about that.
10 This remote clean technology that we invented and
11 have now incorporated in all of our CVD processes,
12 has reduced the amount of PFC emissions by over 99
13 percent compared to what it was before this
14 process.

15 In the dielectric etch processes, in
16 this case we couldn't, because of the process we
17 couldn't eliminate or change the gas that's used,
18 and so we had to go to the second order solution
19 here, which is abatement.

20 And what we did there is to invent two
21 new abatement systems which we call PTS 2000,
22 which is a catalytic system, or a plasma system.
23 And both of these are greater than 90 percent
24 effective at eliminating the PFC emissions.

25 Just to give you a snapshot of what

1 these look like, I won't get into the technology
2 here, I don't think we have a technology type
3 audience. But, there is a process chamber on our
4 equipment and what we're doing is taking, instead
5 of a C2F6 which is a global warming gas, as a
6 process gas, we're changing that to NF3, and it's
7 broken down in this system, used in the chamber,
8 and then goes out through the pump and comes out
9 as free fluorene, which is a treatable emission,
10 and is not a global warming component.

11 What we've done there then is if you
12 look at all of our processes in the beginning the
13 emissions were looking like this. After
14 incorporation of this new process, we are, as I
15 said earlier, greater than 99 percent reduction in
16 the PFC emissions.

17 We did a very similar thing, as I
18 mentioned, with the etch systems. And the most
19 effective system that we've developed here is
20 called in-line plasma treatment, which is a
21 similar kind of situation where the process
22 chamber emissions go through this treatment
23 system, and then all through the exhaust and they
24 are abated to a greater than 90 percent level.

25 I mentioned that we also are looking at

1 the electrical consumption of our systems. And in
2 doing so, we found out that the majority of the
3 electrical power that's used by our systems is
4 used in vacuum pumps, which are needed to create
5 the vacuums in our process chambers.

6 This is the old system. That system
7 used a total power of 4.6 kilowatts. The new
8 system that we developed now uses a total power of
9 1.8 kilowatts. And this is being implemented in
10 all of our systems. So it's a significant
11 reduction.

12 So, the view of the results overall, we
13 started out with something that looked like this.
14 Where CVD emissions and etch emissions and
15 electrical looked like this, greater than 500
16 kilograms carbon equivalent, and through these
17 things that I just spoke about, went through
18 several steps to a point now where we are less
19 than 130 kilograms carbon equivalent per wafer as
20 compared to 500 when we started.

21 Now this is another way of looking at
22 that same data, very graphically, a significant
23 reduction here. And for this we recently received
24 the EPA award for climate protection in 1999. We
25 received the prestigious award from the R&D 100

1 magazine. And we also received an award in Taiwan
2 for the development and marketing of this product.

3 That concludes my presentation. Thank
4 you very much.

5 (Applause.)

6 MR. SMITH: Thank you very much, Jerry.
7 This is another example of being able to deal
8 upstream with opportunities for reducing
9 greenhouse emissions that provide benefits for
10 downstream customers, as well.

11 The next speaker is Bud Beebe. Bud has
12 been with the Sacramento Municipal Utility
13 District. He is the Department of Energy's -- he
14 represents the Municipal Utility District on the
15 Department of Energy's climate challenge. And
16 he's done that for the past five years.

17 He's been active in addressing global
18 climate change issues in the electric utility
19 industry since he joined SMUD's advanced
20 technology programs in 1991.

21 Mr. Beebe is Program Manager for SMUD's
22 successful greenergy program, a green power
23 marketing launched in 1996 for those of us that
24 are residents of Sacramento area, it provides a
25 green option for the electricity that we purchase.

1 He will describe SMUD's participation in
2 DOE's climate challenge program since 1995, and
3 the utility's goals.

4 MR. BEEBE: Thanks, Kent. While she's
5 getting it set up there maybe I'd just like to go
6 over a couple of things that I've learned. Can we
7 have some lights up here?

8 I don't know why the people who have the
9 overheads that use the projector don't need the
10 lights down, but I don't know, anyway, I find
11 these things difficult.

12 You know, a couple things I've heard
13 here today that I think are worth listening to and
14 thinking about especially, so since I've got the
15 mike we'll do this.

16 One of them is that incentives seem to
17 work. And I know from personal experience that
18 incentives work when government gives out
19 incentives. Incentives work when employers give
20 out incentives. And incentives work when parents
21 give out incentives.

22 So, if incentives work in so many
23 different situations, maybe this is one of those
24 things that we ought to be thinking about as we go
25 down the next steps.

1 Also trading seems to work. There's
2 been several trading situations that have been
3 mentioned today that seem to work pretty well.
4 Incentives work well with trading.

5 And while we're on that trading thing, I
6 was thinking about United Technologies. Now,
7 they're 30 times or so bigger than the company I
8 work for, but they only have half the greenhouse
9 gas emissions on an entity-wide basis that we
10 have. Why the hell is this?

11 And worse, they make the stuff that
12 produces the carbon dioxide emissions that we
13 have. Isn't there a trading possibility there?
14 And maybe that's the reason we're in this room.

15 Another thing I heard is that this is a
16 top-down thing. Now, I'm looking around the room
17 and nobody please take offense at this, but I
18 don't see a lot of CEOs in here. Why is that? I
19 think it's because this whole argument's actually
20 fairly simple, and a good CEO really wouldn't
21 spend a whole day being here, they'd have good
22 people here working on it.

23 It's actually not rocket science to
24 figure out what it is you need to get done once
25 you figure out both that you're in trouble, and

1 that you need to do something. So I guess it's
2 our job to do something good about it.

3 And with that, and oh, here we are,
4 we're up and running. So, this is good. Maybe
5 this will work. We need this mike over here,
6 there we go, this is for the record. My name is
7 Bud Beebe.

8 (Laughter.)

9 MR. BEEBE: I would use my own laptop
10 but the truth is last night at 10:00 on highway 50
11 the laptop fell off the back of my motorcycle.
12 And was run over multiple times.

13 (Laughter.)

14 MR. BEEBE: Now, for those of you who
15 are contemplating getting past the Y2K problem,
16 you might consider that. My backup slides are
17 right here, but the laptop is in the trash.

18 So, here we go, let's talk about some
19 stuff. Just to note a couple things about
20 Sacramento Municipal Utility District, we provide
21 electrical generation -- well, we have electrical
22 generation, we provide electricity to the area
23 around Sacramento. That's about 1.2 million
24 people that we serve in the traditional market.

25 We are what I like to think of as being

1 big enough to have some very significant programs,
2 and some very significant opportunities, and yet
3 we're small enough so that we still keep a pretty
4 good contact with what society wants us to be able
5 to do.

6 We're just fortunate. It's a sort of an
7 accident of God that that's where we are, and we'd
8 better be able to work on it.

9 SMUD has been in the greenhouse gas
10 challenge stuff since the beginning of DOE's
11 program. In fact, it goes back before that. One
12 of our board of directors, Peter Keet came to my
13 boss who came to me back in the end of '91, I
14 think it was. And he said, hey, well how much
15 carbon dioxide do we actually give off.

16 And I did a back-of-the-envelope
17 calculation and it seemed to be quite a bit. And
18 so we did a couple of other -- and these are easy
19 calculations to do to get you in the ballpark. It
20 was quite a bit.

21 So he got interested in that, and we did
22 some interaction with the board of directors.
23 They got interested in the whole thing. And this
24 culminated in SMUD being one of the charter
25 members from an electric utility signing an accord

1 with the Department of Energy back in, it was
2 actually signed in January of '95.

3 And at that time we decided that we
4 would actually do this audacious thing. We would
5 reduce our greenhouse gases by 30 percent in the
6 year 2000 relative to 1990. And everybody goes,
7 uhhh, you know, because that seems like a
8 tremendous goal.

9 And actually it is a pretty good goal,
10 but the truth is the back-of-the-envelope
11 calculation showed it was going to be relatively
12 easy if we didn't do anything really stupid. And
13 one of those things is to realize that you do have
14 a commitment here, and to make sure that you don't
15 do things that are really stupid.

16 Well, we've got energy efficiency
17 programs and the big things we knew, is we knew
18 that if we put in some new, modern, natural gas-
19 fired cogens that we'd be able to save enough CO2
20 relative to the old boiler type natural gas plants
21 that we're buying gas from, that we could easily
22 make that 30 percent.

23 Oh, you like to be able to easily make
24 your goals. So it was an easy sell on that side.
25 But I think the most important thing that happened

1 in that whole thing was to get our top people,
2 from the board and management, to begin to think
3 in terms of well, how much CO2 do we actually
4 produce.

5 And it became a part of our integrated
6 resource planning process. We would actually go
7 through and see what each of the steps produced in
8 terms of carbon dioxide. So it was a page or two,
9 if you will, on the integrated resource plan, even
10 though, even though it was not a big driver. It
11 became an important thing that people began to
12 see.

13 And actually we've been able to achieve
14 a 26 percent reduction as of 1998. It was a good
15 water year, but still the reductions we've been
16 able to achieve have been both real and important.
17 So not to minimize their importance.

18 I think that for both SMUD and the
19 nation, the Department of Energy climatewise and
20 climate challenge programs have really been a time
21 of education. I mean what the heck is it that we
22 do as individuals, as corporations, in our daily
23 lives and in our thought processes and so forth,
24 that causes this carbon dioxide thing to happen,
25 and other greenhouse gas things to happen.

1 They don't just happen. They happen
2 because people do things. But we don't know what
3 they are. I heard this morning that it was down
4 in Chula Vista they're trying to find out ways to
5 meter energy use at a much more local level so
6 people can get some feedback. People have no idea
7 what it is that they do that causes them to make
8 their electricity bill go up at the end of the
9 month.

10 They know that running their air
11 conditioner seems to do that because their bill is
12 higher in the summertime. But they don't actually
13 know what it is about these things. I mean, go
14 around, we could go around the room here. Nobody
15 knows, day to day, what it is. Turn on this
16 light, that light, this light over there, running
17 the car from here to there, they know it has
18 something to do with use, but there's no direct
19 feedback mechanism.

20 And so this is the first feedback
21 mechanism for the nation. We've known since we
22 started charting our greenhouse gas emissions that
23 the easy reductions in California for an electric
24 utility are mostly gone.

25 We took up some of the last ones when we

1 were able to replace the stuff we were buying from
2 PG&E and Edison from their old boilers at Moss
3 Landing and Pittsburg and so forth. And when we
4 replaced those with modern stuff, -- there's still
5 some stuff to be done out there, but the easy
6 stuff is getting slimmer and slimmer to find.

7 We also know that it's easy by running
8 the numbers that by replacing the aging coal
9 plants in the east the nation will be able to make
10 its Kyoto Accords, at least in terms of what its
11 commitments from the electric industry ought to
12 be. What kind of ramifications does that have for
13 California? I think we need to think about that.

14 We know now that California is the
15 leader in what we call eligible renewables for
16 making electricity. We have 11 percent of our
17 electrical energy usage in California coming from
18 the right stuff. That's not a bad place to start
19 from.

20 Let's look at some next stuff here.
21 What have we observed? We've observed, for one
22 thing, that the U.S. Senate, despite all the anti-
23 Kyoto rhetoric, has done some other things. Hey,
24 this guy Chaffey, god rest his soul, he came out
25 and was trying to do the right thing with some

1 early credit stuff. Merkowski Abul, he was after
2 some stuff there and he tried to get some money
3 out of this thing. People are moving on this
4 thing.

5 And I'm going to take a time here and
6 look at this last one, S-117. Look at this thing.
7 This just came out in October of this year, and it
8 was introduced by Senator Craig from Idaho and
9 very interestingly, Senator Hagel. Do we remember
10 that name? It was Byrd and Hagel that introduced
11 in the Senate the resolution that prevents the
12 administration from spending any money or doing
13 anything to meet the Kyoto Accords. And yet we
14 find that right here, look at this -- let me read
15 this to you.

16 This is going to give tax credits for
17 replacing the operation of a facility, the
18 taxpayer, it has to reduce greenhouse gas
19 emissions on a per unit of output basis compared
20 to such emissions of the replaced facility. In
21 other words, you're going to take and repower an
22 electrical generation station. And it has to use
23 the same type of fuel. That means coal,
24 incidentally.

25 So, people on the east coast, people in

1 other parts of power, even people in Congress who
2 have been saying this Kyoto stuff is a bunch of
3 crap, are making moves right now to position
4 themselves to take advantage for what they know is
5 a very very important item.

6 Okay, we also know that, well, everybody
7 else is working on this coal issue, there are
8 other things for California. Let's get right here
9 and look at the existing resource mix in
10 California.

11 The column there on the left is
12 different types of fuels that we can make
13 electricity from. The column called California is
14 from the power content label that the California
15 Energy Commission puts together. These are rough
16 numbers, but they're fairly robust. You can move
17 them around a lot and they don't change the answer
18 very much.

19 On the far right are typical emissions
20 in carbon dioxide equivalents that we get from
21 each of -- for using each of these fuels on the
22 left in typical kinds of applications. And,
23 again, you can make these numbers go up and down
24 by 20 to 30 percent, but you don't change the
25 ultimate outcome very much by doing so.

1 Now, a lot of coal plants in the east
2 actually have emission numbers that are over 3000
3 pounds of carbon dioxide per megawatt hour. You
4 guys use about a megawatt of electricity in your
5 house every month. So you make about 3000 pounds
6 of carbon dioxide if you're getting your
7 electricity from a coal plant.

8 Petroleum plants are much less. They're
9 not very important to California. Natural gas are
10 even very much less. Now, if you use the most
11 modern natural gas stuff, and you use it in a
12 combined cycle, you can drop that number to maybe
13 800, but probably 900 is a better number.

14 And nuclear doesn't add anything. Non-
15 nuclear, renewables don't add anything, and hydro
16 doesn't add anything. And yet we have significant
17 amounts of those in California today.

18 Now, if we look at USA, they have a
19 different problem. They've got a whole hell of a
20 lot more coal than we do. And look at that big
21 lever they've got out there. That leads us to
22 that first statement that I made about people are
23 going to meet the Kyoto Accords in the electric
24 industry by dropping the CO2 emissions from the
25 coal plants because it's easy.

1 What are the implications for
2 California? Natural gas, there's a lot less
3 natural gas out nationwide than there is here in
4 California. There's a lot less renewables outside
5 of California than there is here. Nuclear is
6 about the same. And hydroelectricity is much more
7 prevalent here in the west than it is on the east
8 coast.

9 But here we get to the crux of the
10 thing. Now, this is the point at which my wife,
11 she makes a little dot on the blackboard, and she
12 says, now, Bud, I want you to connect the dot on
13 this one, okay. Because it's that simple. It
14 really is. Once you look at these numbers.

15 For SMUD our entitywide emissions rate
16 is some 750 pounds of CO2 per megawatt hour that
17 we're responsible for. In California it's
18 something like 800. And again, you can make it go
19 up to 900 to 1000 if you want. You can maybe
20 drive it down 750. But you're not going to move
21 that number very much.

22 And in the United States it's somewhere
23 around 1500. Remember, a coal plant, the bad ones
24 are out there at 3000.

25 A natural gas combined cycle power plant

1 produces 900. So the big thing is you can't
2 reduce greenhouse gas emissions in California by
3 adding combined cycle natural gas fired power
4 plants.

5 Now, I could stop it right there, but I
6 have got some answers. And this is some stuff
7 that we need to look at -- let me go back a
8 second.

9 Nuclear plants are getting older, they
10 are not getting any more popular. People who
11 think that they're going to be extended beyond
12 their life because of the CO2 question I think are
13 probably whistling to the wrong choir.

14 The new hydro projects are unlikely,
15 certainly they're unlikely around here. And the
16 California population, incidentally, will
17 increase. And did you notice how all of you
18 salivated when the gentleman from Toyota put up
19 the Prius.

20 (Laughter.)

21 MR. BEEBE: Now I don't think that we,
22 as a civilization, should try to reduce our energy
23 consumption to the cold black darkness of the
24 ancient ages. I just don't think that's a
25 reality. That's not to say that energy efficiency

1 is not an important and very very worthwhile thing
2 to do.

3 My house uses 350 kilowatt hours a month
4 on average, and I challenge anybody in this room
5 to come up and do a whole lot better than that.

6 So I think that energy efficiency is
7 important. You should think it's important. But
8 it doesn't get us there. Because we are
9 increasing in our population.

10 Here's some customer preference stuff.
11 This is for the people who think that we're going
12 to have nuclear around for awhile. This is a
13 preference support thing we did in March of '97.
14 We asked two different types of questions, and
15 these were done in several different ways so they
16 validated well.

17 The stuff above the zero percent line is
18 indicating support for certain types of generation
19 technologies, and the stuff below the zero line
20 says that I really don't want that stuff in my
21 mix, even if it's there.

22 So, the winner is solar. Most people
23 like it. Very few people don't like it. The next
24 is hydro, wind, natural gas is a big winner with
25 our people. The ones in the middle which include

1 geothermal, landfill gas, and forest waste, notice
2 their columns are a little smaller so people don't
3 know as much about them. I think that would help
4 swing things. But they really don't like nuclear,
5 and they really don't like coal. We are a
6 society.

7 So if those are the challenges, what are
8 the opportunities? Well, California's about ten
9 years ahead of everybody else on sustainable
10 electrical generation. I think that we need to
11 maintain that leadership by deploying additional
12 renewable resources so that when the rest of the
13 U.S. needs those resources they will have
14 economically viable renewable resources that they
15 can actually purchase and it won't kill them at
16 the pocketbook.

17 Because they're going to get to that
18 process as soon as they get rid of the existing
19 coal plants and their demand still grows up to
20 meet and need additional capacity.

21 And then we can sell those technologies
22 to the rest of the world and we will do ourselves
23 two favors. One, we'll be rich. And, secondly,
24 when I go to see my grandchildren next Saturday
25 I'll be able to say, you're going to do better,

1 you're going to do a lot better.

2 Thank you very much.

3 (Applause.)

4 MR. SMITH: Thank you very much, Bud.

5 One of the things I've noticed in a number of the
6 presentations is that the range of involvement of
7 leadership, whether it's a CEO, a chairman of the
8 board, and I was noticing in Bud's presentation he
9 started by mentioning just a simple question, one
10 of his board members, Peter Keet asked just a
11 simple question, what's the emission levels. And
12 that started a chain of events that resulted in
13 some pretty remarkable things.

14 Our plan right now is to make a shift
15 from the focus on business and industry to
16 focusing on organizations that have been involved
17 in partnership with business and industry. Some
18 are nonprofit, some are governmental.

19 We're going to hear first from Michael
20 Burnett. He was recently appointed Executive
21 Director of the Oregon Climate Trust. He's an
22 environmental engineer with over 20 years of
23 technical and policy experience in energy
24 efficiency, renewable energy and climate change
25 projects.

1 Before joining the Climate Trust he was
2 Vice President for Trexler & Associates,
3 international consultants on climate change
4 mitigation. Mr. Burnett was the founder of the
5 Conservation and Renewable Energy System, a
6 consortium of public power utilities in Washington
7 State. He also previously worked on the
8 integration of energy conservation into power
9 planning for several power councils,
10 administrations and committees in the Northwest.

11 And will tell us a little bit about the
12 work of the Climate Trust.

13 MR. BURNETT: Thank you. Well, good, I
14 really appreciate the opportunity to come and
15 speak before such an esteemed group of
16 representatives from companies who are doing such
17 a great job, an unheralded job on reducing the
18 greenhouse gas emissions.

19 What I'm going to do is talk to you
20 briefly about the Oregon Climate Trust and a
21 little bit about the Oregon experience in
22 developing policy. A big part of the purpose of
23 the meeting here today is to get a group of people
24 together and start talking about how policies
25 might evolve in the state.

1 Oregon, as you may be aware, has the
2 first legislative CO2 regulatory standard in the
3 United States. What it does is regulate CO2 by
4 requiring new power plants and other large energy
5 facilities offset part of their CO2 emissions.
6 That's a very significant part, it isn't the
7 majority of it.

8 Second, in the process of setting up the
9 policies, a very important thing was to encourage
10 efficiency and I'll explain how that's done in a
11 moment.

12 Flexibility has been one of the key
13 words heard from a number of corporate folks. And
14 I'm very supportive of that, and this bill, or
15 this process developed in Oregon provides a good
16 bit of flexibility to the developers.

17 And finally, this is an evolving
18 standard, so it's basically benchmarked to fit to
19 technology efficiency. As technology efficiency
20 evolves, so the standard gets more stringent.

21 A little bit of history. Going back
22 about five years ago there was several interest
23 groups, the utilities and power producers were
24 looking at Oregon's need for power, a requirement
25 that you demonstrate a need for a new power plant

1 before getting a site permit. And in the evolving
2 restructured world of electricity they viewed this
3 as an impediment.

4 Meanwhile the environmental groups were
5 very opposed to any changes in the need for power
6 requirement, and they were very concerned about
7 increasing pollution, overbuilding of facilities
8 which has happened before.

9 Essentially what you had was a political
10 tradeoff whereby the environmental groups agreed
11 to support, and the legislative compromise agreed
12 to support the elimination of the need for power
13 rule in exchange for a regulation of CO2
14 emissions.

15 So, out of this came a two-part
16 compromise. The first part was the 500 megawatt
17 best of batch proceeding. This essentially was a
18 competition for the right to site a power plant.
19 One power plant in the State of Oregon, up to 500
20 megawatts. And it was based upon least
21 environmental emissions, least essentially water,
22 air and land impacts, but the facilities were
23 essentially and it came down to who did the best
24 job of dealing with their CO2 emissions.

25 Meanwhile on a parallel track there was

1 a Governor's task force established to review the
2 siting rules, and answer some questions. Should
3 the need for power be eliminated, should CO2
4 mitigation be required, and just generally to
5 upgrade the standards in response to changing
6 times.

7 So, what do we learn out of the best of
8 batch. Basically successfully demonstrated that
9 CO2 mitigation could be done.

10 About \$5 million was spent by the
11 winning project on a number of different types of
12 activities, photovoltaics, methane to electricity,
13 reforestation, other types of projects. You'll
14 hear about one of these a little bit later on our
15 panel.

16 The lessons that were learned were
17 essentially that the competitive market can afford
18 to add some CO2 mitigation costs and still
19 survive. This added about less than half a
20 percent to the life cycle cost of electricity
21 facilities.

22 CO2 mitigations are practicable and
23 available. Very little work had been done in this
24 area before, at least in the State of Oregon. And
25 also demonstrated that a state regulatory agency

1 can effectively, within the confines of a
2 proceeding, evaluate CO2 mitigation. Of course,
3 it had never been done before.

4 So both the Governor's task force and
5 this best of batch proceedings led to Oregon House
6 Bill 3283, which essentially revised the energy
7 siting rules to reflect the industry
8 restructuring; it eliminated the need for power
9 rule; included a carbon dioxide standard, and it
10 sets a ratcheting standard for emissions over
11 time.

12 Finally, it enabled a developer-funded
13 trust for CO2 mitigation, which basically evolved
14 into the Oregon Climate Trust.

15 So, the Oregon standard essentially is
16 17 percent better than the best plant operating in
17 the United States of a similar type. It's about
18 17 percent less than -- well, anyways, I'm going
19 to move on beyond the numbers.

20 So the developer has the flexibility to
21 comply. One thing is if you exceed the reference
22 plant efficiency level, if you put in a more
23 efficient plant than the standard, that helps you
24 meet the CO2 standards, the 17 percent.

25 There's a wide variety of carbon offset

1 type projects are eligible, all the way from
2 energy efficiency, renewable power, to various
3 land use change and forestry type options. You
4 have to deal with carbon dioxide, not the PFCs and
5 other types of activities.

6 Finally, the developer can choose a
7 compliance path option. They can basically do
8 their own programs, do their own projects, to go
9 to the energy facility siting council and to sell
10 these projects, and then implement them
11 successfully.

12 In addition there is something called a
13 monetary path which tends to have a lower cost,
14 and you avoid the risk of managing your own
15 projects. That gives the money to me, the Oregon
16 Climate Trust, and there's a dollars per ton
17 formula which determines the extent, the amount
18 you'd have to pay. Currently 57 cents a ton.

19 Okay, so Oregon Climate Trust, we're
20 nonprofit, 501(c)(3). We administer the funding
21 under the CO2 offset requirements of the Oregon
22 legislation, and we basically fund projects that
23 offset and sequester CO2.

24 We have a seven-person board, three
25 appointed by the Energy Facility Siting Council,

1 three appointed by an environmental group, and
2 then one appointed by the developers, themselves,
3 plus everyone who's giving us money under this
4 process gets to assign a nonvoting board member to
5 participate in our processes.

6 So we have in addition to mitigating the
7 Oregon power plants, which is our top priority, we
8 have another mitigation program that we're
9 starting which is a greenhouse gas reduction
10 program. I'm going to skip over that.

11 In addition we have an education
12 function. I'll skip over that one, too.

13 So what are the lessons that we really
14 learned from the Oregon Climate process? One is
15 the policy innovations. This is the first
16 greenfield CO2 mitigation requirement in the
17 United States. It's up and working. The
18 utilities there, the independent power producers
19 are not going out of business.

20 Second of all, it provides the offset or
21 the developer with flexibility, both in terms of
22 choosing a process, and in the types of offsets
23 they want to bring to the table.

24 And finally, it enables a nonprofit
25 trust to really administer a regulatory

1 responsibility which could have resided in a state
2 agency. But they thought there's a number of
3 efficiency reasons for putting it into the
4 nonprofit sector.

5 And what we've learned out of the Oregon
6 experience is that the competitive award of a
7 siting permit on the basis of environmental
8 performance worked. Second, that the market can
9 bear CO2 mitigation costs. And finally, that --
10 which, again, less than a percent -- and that the
11 CO2 mitigation projects and activities are
12 practicable and available.

13 So I really appreciate the opportunity
14 to speak before you. I'm willing to take
15 questions probably later, because I think we want
16 to get on to what will be, I'm sure, very
17 interesting policy discussions that will ensue
18 here.

19 So, thank you very much.

20 (Applause.)

21 MR. SMITH: Thank you very much,
22 Michael. One of the questions that is very much
23 with us in California is with regard to energy
24 programs, environmental programs and the role of
25 nonprofits versus government agencies.

1 This is a very good example of a sister
2 state here taking this step toward the nonprofit
3 side. It's a very good presentation.

4 Our next speaker is Sally Ericsson.
5 Sally is the Director of Outreach at the Pew
6 Center for Global Climate Change where she works
7 with Business/Environmental Leadership Council. I
8 think many of you are familiar with Sally and the
9 Council.

10 She also works with state, local and
11 federal agencies and other organizations. She was
12 previously Associate Director of Natural Resources
13 for the Council on Environmental Quality. She has
14 served at the U.S. Department of Commerce as
15 Deputy Chief of Staff, and as Associate
16 Undersecretary for Economic Affairs.

17 She'll tell us a little bit about the
18 Pew Center's program. And that program is, as you
19 know, one that's worked for some time and quite
20 successfully with many Fortune 500 businesses.

21 MS. ERICSSON: Thank you. See if I can
22 make my easy technology work here.

23 Thank you, this has been a very
24 interesting day so far. And I'm looking forward
25 to the discussion actually. I welcome the

1 opportunity to talk to you about the importance of
2 partnerships in addressing the climate change
3 issue, and also the role of the Pew Center in
4 promoting voluntary action.

5 The Pew Center was founded a year and a
6 half ago to advance the debate on climate change
7 through credible analysis and cooperative
8 approaches.

9 It was founded by the former Assistant
10 Secretary of State or Oceans Environment and
11 Science. Is that right, Mike? Elaine Clausson,
12 she's our president. And we get our funding from
13 the Pew Charitable Trust, but we're actually a
14 separate entity. So we're very new on the scene
15 on this issue.

16 The goal of the Center and our mission
17 right now is -- well, the reason it was founded is
18 because the discussion of climate change,
19 especially in Washington, is very polarized. And
20 we're trying to de-polarize it, that's a verb, the
21 debate.

22 In Congress, despite the optimism that
23 there are these three legislative vehicles, all of
24 which are going probably nowhere, Congress is very
25 polarized on the issue. There's a lot of

1 misinformation, people are just sort of stuck in
2 their positions, and there's very little movement.

3 The administration's hands have been
4 tied, and they talk about, by the Hill. And the
5 administration, of which I was just a member of,
6 so it's interesting for me to talk about this --
7 they talk about the science of the issue, but they
8 don't talk about Kyoto. They don't talk about the
9 tough issues. They do talk about the science,
10 however.

11 And they're doing lots of internal
12 things. They have Executive Orders on efficiency
13 and stuff, but they're being very quiet because it
14 is so polarized.

15 The business community, there is a
16 widely held view, a year and a half ago, an still
17 i's widely held that there's no scientific basis
18 for taking any action on climate change. And
19 there's no need for the private sector to reduce
20 their emissions.

21 As a friend of mine said, it was just
22 all a bunch of hooey. I think that's all too
23 often the prevailing view of the business
24 community.

25 So, therefore we need partnerships, need

1 to link people together to connect the dots on the
2 issue, to make some progress.

3 So the Center has four programs to deal
4 with depolarizing the issue. One is we've a
5 really extensive program of releasing scientific
6 analyses, environmental impacts. We did a widely
7 reported study that sort of synthesized where the
8 science was on the issue. And we're coming out
9 with a series of economic papers.

10 And these studies are done by very well
11 known academics and policy people who are widely
12 respected, lots of different communities. Because
13 the debate too often is articulated on either one
14 side or the other.

15 We have an international outreach
16 program which I won't get into today. We have an
17 extensive public education effort.

18 It's clear that there's not a lot of
19 understanding about the importance of the issue in
20 the general public, or among opinion elites. So
21 we advertise extensively in major newspapers and
22 business magazines usually when we issue reports,
23 and we advertise what the business community's
24 doing on climate change.

25 In the packets that I had outside I put

1 in there are collections of the advertisements
2 we've brought, and also a lot of the press clips,
3 because we have an aggressive press outreach
4 effort, as well.

5 And then finally the fourth pillar of
6 what we do is our business -- is our activities
7 with the business community.

8 The Pew, we like to think that we're
9 creating a new center in the climate change
10 debate, and the key to the effectiveness of the
11 center is what we call the Business Environmental
12 Leadership Council. We have three members,
13 representatives of three companies that are
14 members here today, Mike McAdams from BP, and
15 Judith Bayer from United Technologies and then
16 Toyota.

17 The BCL is 21 major companies. They're
18 mostly Fortune 500. And they're demonstrating
19 leadership and taking significant voluntary action
20 to reduce emissions.

21 Six have announced emissions target, and
22 then as you've seen from Mike's presentation and
23 Judith's, and Toyota's, there are other activities
24 they are pursuing, as well.

25 These companies are, as you can see from

1 this, are major companies. They're in a wide
2 variety of economic sectors. They are from
3 sectors that have a lot of emissions, but they
4 have different kinds of environmental and
5 emissions issues. And they're leaders.

6 And they all took a stand on this issue
7 at a time when their peers in the business
8 community simply were not doing that. That's why
9 we call it the Business/Environmental Leadership
10 Council.

11 The BELC, we do not take any funding
12 from any of the companies or members of the BELC.
13 And we also -- the members of the BELC were
14 invited to be members, so it's different from a
15 lot of Washington organizations because we're not
16 a coalition where the businesses write a check and
17 join. So it's a different cast than a lot of
18 organizations that work on policy issues.

19 The BELC members did agree to form
20 principles which I think are important to discuss.
21 First, there's this issue that we've talked about
22 already today, that there's enough science that --
23 although there's a lot of uncertainty, there is
24 enough science that businesses who sign up know
25 they have to take actions to address the

1 consequences of climate change.

2 And it's increasingly clear that more --
3 I'm always an optimist -- I think more and more
4 businesses are taking that view. And we're moving
5 away from debates about the science with the
6 business community to other issues.

7 Second, businesses can and should take
8 concrete steps now in the U.S. and abroad to
9 assess their opportunities for emissions
10 reductions, establish and meet emission reduction
11 objectives and invest in new more efficient
12 products, practices and technologies.

13 And I think you've seen today that not
14 just the BELC companies, but companies across the
15 board at this discussion today, are doing exactly
16 that.

17 The third principle is that the Kyoto
18 agreement represents a first step in the
19 international process, and you can read the rest.
20 We've tried very hard to focus the Pew Center's
21 activities on solutions, rather than on getting
22 into the debate about the merits of the Kyoto
23 protocol. And we're usually successful at that.

24 And finally, the companies agree that we
25 can make significant progress in addressing

1 climate change and sustaining economic growth in
2 the U.S. by adopting reasonable policies programs
3 and transition strategies.

4 And here we're not -- we've done a lot
5 of work on early action, but given the state of
6 where things are in Washington, we're trying to
7 sort it out, what mix of policies should look
8 like, both for what we should promote for next
9 year, and what we should promote for 2001 and
10 beyond.

11 Now, I'd briefly like to talk about some
12 of the activities the companies are involved in.
13 You saw the presentations by Toyota and BP Amoco
14 and United Technologies already. But we also have
15 Shell International, which has made a commitment
16 to exceed the Kyoto targets. And they're working
17 on increasing the production of natural gas and
18 encouraging the use of low carbon fuels.

19 I've just joined the Pew Center in
20 September and one of the things I'm working on is
21 trying to compile what the different activities of
22 these companies are involved in. Because I think
23 it's important to inventory not just what --
24 there's several things need to be inventoried.

25 One is what incentives there are,

1 programs there are that companies can get access
2 to, in partnership with the states and the federal
3 government. But another is there's a wide variety
4 of things companies are doing. And we need to
5 kind of get the information in the public domain
6 so other people who are interested can learn. But
7 that's my optimistic nature, too, that people will
8 learn from each other in this.

9 In addition to the new car that Toyota -
10 - that people in California will be buying next
11 summer, Toyota is doing a lot of things in
12 California to reduce plant emissions, water use,
13 to reclaim and recycle, these are all significant,
14 they all add up to the strategy of reducing
15 emissions.

16 Another company that's doing a wide
17 variety of activities is ENRON. They're investing
18 substantially in wind energy. They've got a
19 cogeneration plant in Poland they point to. And
20 they've increased their energy efficiency at their
21 headquarters. And they're pursuing a lot of
22 partnerships internationally on lots of climate
23 change issues, CDM, joint implementation and
24 they're very aggressive on the issues.

25 And then finally the company I want to

1 talk about today is DuPont, which at our early
2 action conference in September announced that by
3 2010 they were going to reduce their greenhouse
4 gas emissions by 65 percent, using 1990 as a base
5 year.

6 They also announced they're going to
7 hold their energy use flat, using 1990 as a base
8 year. And that they would increase their
9 renewable resource for 10 percent of their global
10 energy use.

11 And given the size of DuPont, this is
12 going to have a huge impact on the renewable
13 markets in a positive way.

14 What's next for the Pew Center and for
15 this issue, I think that we want to continue to
16 focus on rational solutions that produce results
17 that are measured in real emissions reductions.

18 Business is -- we want to encourage
19 business and work with our businesses to continue
20 to look for opportunities to promote -- to take
21 action and to promote voluntary action in other
22 companies, as well.

23 We're beginning to think -- work too
24 with state and local governments who are -- and
25 some of them are away ahead on this. They are

1 demonstrating their own leadership by reducing
2 their own emissions, in addition to setting
3 policies and incentives for the companies in their
4 states.

5 I think what -- it's important
6 leadership for the business community, it's also
7 important leadership for the political and policy
8 officials in Washington that the states are taking
9 action.

10 On the policy and economic analysis side
11 there's still a lot of need for accessible
12 information analysis. This year we're going to
13 continue our environmental impact series, but we
14 also have a series on the economics of climate
15 change, which is a desperately needed subject to
16 get discussed in the policy arena.

17 And finally, for the purposes of this
18 workshop today we are going to spend a lot of time
19 on policy development. We spent a lot of time in
20 the federal arena, but I think we're going to look
21 more in the state arena, because the states are
22 interested in this issue now, and we need to
23 develop mechanisms in the sense that are flexible
24 and that are for the companies that are taking
25 action and are compatible with continued economic

1 growth.

2 And I think the important thing we
3 should leave this day with is that California has
4 always been, the issue of California on
5 environmental issues and energy issues is always
6 had a lot of leadership. And that point was made
7 clearly just a few minutes ago.

8 But it's important that California
9 continue to play that role and step up to the
10 plate and to reassert its leadership, because when
11 you try things in California we can help get the
12 states, we can move those programs to the rest of
13 the country.

14 Thank you.

15 (Applause.)

16 MR. SMITH: Thank you very much, Sally.
17 Comments on California well taken, I think, that
18 the Pew Center has done a remarkable job on the
19 education and the visibility of it. And also in
20 bringing together a remarkable industry group to
21 develop a consensus.

22 Our next speaker this afternoon is Eric
23 Heitz. Eric has been with the Energy Foundation
24 since it began in 1991, and has currently served
25 as --

1 AUDIENCE SPEAKER: I think you might be
2 out of order, are you sure --

3 MR. SMITH: That's a possibility. Why
4 don't I introduce Jim Cathcart.

5 (Laughter.)

6 MR. SMITH: Sorry. Jim is -- this
7 sounds more what I was expecting -- Forest
8 Resource Trust Manager for the Oregon Department
9 of Forestry. From 1995 to '97 he served as
10 Communications and Stewardship Manager for the
11 Campbell Group, that's a private timberland
12 investment company.

13 Previously he had worked for the Bureau
14 of Indian Affairs in forest management planning.
15 He will talk to us about the goals of the Forest
16 Trust in Oregon, the challenges and achievements
17 in carbon offsets.

18 Sorry about that.

19 DR. CATHCART: Well, thank you, Chairman
20 Keese and Mr. Smith and Members of the Commission.
21 You've been a very enduring audience. I suggest
22 that maybe let's do yourself a favor, stand up,
23 it's been an hour, stretch out a little, pretend
24 you're a tree, reach for the sky, something like
25 that.

1 While you're doing that I'd like to
2 thank Nan Powers and Cindy Wren, they were very
3 helpful in making sure I knew how to get down
4 here, and keeping me on task and being prepared.

5 When I was going over my presentation on
6 the plane last night, I slept through it. So
7 don't feel bad --

8 (Laughter.)

9 DR. CATHCART: -- if the same thing
10 happens to you. I can relate to that.

11 So I'm going to give you my summary
12 points first. The main thing I want you to
13 remember from this is that sink enhancement is not
14 a replacement for emission reductions. So I want
15 to be clear that when I talk about carbon
16 sequestration and sink enhancement I'm not saying
17 that this is the placebo that's going to solve all
18 problems.

19 Emissions reductions is critical.
20 That's where we're going to make the most gains on
21 this. I think where sink enhancement goes and
22 forest sequestration goes is getting that last 5
23 or 10 percent where your marginal cost curves are
24 too high. But here this is a very relatively low-
25 cost way to get emission offsets that can package

1 around maybe some of the real gains that are also
2 occurring through emission reduction.

3 So that's one thing I want you to
4 remember. The other thing is that for offset
5 programs like mine to exist, the motive needs to
6 be there to fund them. And I've been very pleased
7 to hear that we've had internal driven motive from
8 corporate values.

9 The Oregon story is that it was a state-
10 driven motive in terms of the legislation that
11 Mike talked about, and the siting requirement.
12 And we actually have national legislation starting
13 to form, and international, the Kyoto type
14 discussions.

15 The third thing I want you to remember
16 is that offset programs must deliver the goods in
17 a credible way, and that's my perspective. I
18 think the challenge facing me as an offset program
19 manager is that we have to deliver the goods. I
20 mean people are putting faith in us that we can go
21 out and sequester carbon, and we need to show
22 that. That needs to be measurable, that needs to
23 be verifiable, and that needs to be done based on
24 agreed-upon policy standards.

25 So now you can check out, and that's all

1 you need to know.

2 I wanted to start talking about from the
3 landowners' perspective. They're a key partner
4 here, the landowner. Can't read that, says when
5 you're 65 years old, why spend \$50,000 of your own
6 money to plant trees that won't be harvested until
7 your bones are underground.

8 So that's one of the perspectives here.
9 And I think what we're hearing here is that
10 reforestation costs money. Averages \$500 to \$600
11 an acre. An acre is about the size of a football
12 field. So if you're reforesting about ten
13 football fields, that's \$5000 to \$6000. If it's
14 around 100 football fields, that's \$50,000 to
15 \$60,000.

16 It's long term. You plant the trees and
17 they take awhile to start to really get to be
18 forests. Banks are not necessarily going to loan
19 you this money and secure that loan based on a
20 bunch of little tiny seedlings, so you're looking
21 at loaning -- to get the money to maybe get
22 another mortgage out of your house, but maybe
23 you've already bought your boat, or maybe you're
24 already putting your kids through school on that,
25 or maybe you're paying for yesterday's e-trading

1 losses.

2 So, our program was designed to kind of
3 fill a niche. And that is that landowners have a
4 need to plant trees, they don't have access to the
5 capital. And that's what the Forest Resource
6 Trust Program is basically about.

7 The asset we worked with are under
8 producing forest lands. These are widely
9 scattered, capable of growing forests. The key
10 point is that they are not in forest now. They
11 are either in crop or pasture or brushland or
12 burned over, and they're not subject to a
13 reforestation requirement under the Oregon Forest
14 Practices Act.

15 And the Oregon Forest Practices Act is
16 very similar to the California Practices Act, it
17 kind of mandates some certain forest management
18 activities occur, such as planting trees after
19 timber harvest.

20 And the Trust is not about helping with
21 that obligation. That is an economic obligation
22 of the landowners following timber harvest.

23 We're kind of dealing with the abandoned
24 lands, or the lands that have been kind of
25 perpetually unforested. Got some pictures of the

1 stuff. That's kind of pretty, isn't it. If it
2 looks ugly, that's the point.

3 Noninvasive plants, Scotch broom,
4 evergreen huckleberry. Okay, this is what our
5 statute says about the Trust. The Forest Resource
6 Trust shall provide funds for the financial,
7 technical and related assistance to help
8 landowners establish and approve the management of
9 forests for timber, wildlife, water quality and
10 other environmental benefits.

11 The history of the Trust was that it was
12 created by the Oregon Legislature in 1993 by
13 unanimous vote. It was an idea that came to be
14 through a collaborative recommendations of
15 forestry analysts, private forest landowners,
16 environmental groups, bankers, public agencies
17 under the direction of our Secretary of State at
18 the time, Phil Keisling.

19 And this was kind of his vision for the
20 Trust. And it's a whole story why he got
21 involved, but it really came from his heart.

22 What I want you to notice here is
23 nobody's talking about carbon. We just want to
24 get trees in the ground. We want to reforest
25 these abandoned lands. They're going to produce

1 benefits for Oregon, as well as the landowner.

2 So, entering the carbon business. What
3 were some of the events that were leading to this.
4 Well, this kind of started right around the time
5 that the Trust came to be, in the early '90s. And
6 the first reason was that the Forest Resource
7 Trust needed money. Nothing altruistic there. We
8 were seeded by our Legislature and what the
9 Legislature provideth, the Legislature will taketh
10 away. And we went through that. So we had a
11 great program with no money in it. We were
12 looking for money.

13 Pacificorp, that was their name then,
14 now they're Scottish Power Pacificorp, was doing
15 test wells. They were looking for ways to have
16 low cost mitigation for emission offsets. And
17 they had set up pilot projects with landowners
18 directly through contracts, kind of testing the
19 waters, using this under-producing land asset.

20 Mike Burnett did a great job of kind of
21 summarizing the site license best of batch
22 proceedings that occurred, as well as the law that
23 came out of it. And actually I brought a couple
24 handouts in the back. This is one that talks
25 about the siting standards on the CO2 basis under

1 the law. And I think most of you already grabbed
2 this because I noticed there weren't any more
3 there. But this article on electricity tells the
4 story about the best of batch. And it's fairly
5 well done. It's written from the perspective of
6 those who won, so take that in mind.

7 So what we ended up with was an offset
8 portfolio for the Klamath Cogeneration Project in
9 southcentral Oregon that had the solar electric
10 light fund, which was going to photovoltaics,
11 electricity generation from waste methane,
12 geothermal heating projects, and the Forest
13 Resource Trust, that's me, and the Oregon Climate
14 Trust which you already just heard about.

15 Why the Trust, why was the Trust
16 selected as an offset program? Five factors I
17 want to go through. Additionally, that means that
18 the acres that we're reforesting are the capital
19 that's provided to the Trust that's using the
20 fund, the reforestation on those acres, are
21 reforesting new acres. Acres that would not
22 otherwise be reforested in the near term, or even
23 in the far term. That's what we're talking about.
24 New forests above a baseline.

25 The permanence is these are long-term

1 contracts that run with the title of the land.
2 There's disincentives for harvesting early under
3 the Forest Resource Trust. The carbon is
4 permanent, I mean in the sense that it's a long,
5 we're not going to plant the trees and mow them
6 over in five years.

7 Measurability. We can measure and
8 estimate the biomass in the forests. We can
9 translate that biomass to carbon accumulation in
10 the forest. However, going from the carbon
11 accumulation to the forest to what counts as a CO2
12 emission offset or a credit is more of a policy
13 conversion, not a biological conversion.

14 So we can do the biologics and then you
15 can, depending on how, deciding what counts, you
16 can convert that to a CO2 offset, and I'll go
17 through that briefly.

18 Reliability. The trees don't get up and
19 walk away. They don't move around, they stay put,
20 they're very good at that. Photosynthesis -- oh,
21 I meant to ask you -- I blew it -- photosynthesis
22 is the key here, in case you were wondering. I
23 always kind of blow past this. Why carbon in
24 trees, well, trees produce their food by taking
25 energy from the sun and building sugars, and they

1 use CO2 from the atmosphere to do that. It's the
2 exact reverse process of energy combustion. So
3 that's where trees come in, in case you were
4 wondering what's this tree guy doing here. That's
5 what it's about.

6 So, photosynthesis is not subject to
7 state and federal appropriations, so it's fairly
8 reliable.

9 (Laughter.)

10 DR. CATHCART: Leakage is the last
11 factor that we need to be worked at, and that is
12 are we stimulating some other activity by
13 providing these funds to the landowners that may
14 not be carbon sequestration friendly. And I
15 really don't think we have leakages as an issue
16 for us, but that is one of the other criteria that
17 a project level needs to worry about.

18 And the last reason why the Trust was
19 selected, it's kind of stated here, and kind of
20 played in the proceedings is that -- and this was
21 reinforced by some of Pacificorp's earlier
22 experiences.

23 When a company works directly with
24 landowners that can get very cumbersome. We are
25 the Department of Forestry, we have a service

1 forestry network, we're connected with landowners,
2 we know where these sites are, we're used to
3 working with them, we know how to get the trees
4 growing, and it was that infrastructure that we
5 brought, and the fact that the Trust just so
6 happened to be designed to fit these other
7 criteria, that made us attractive and helped us in
8 the siting procedures.

9 Okay, so what are we expecting to do
10 with our \$1.5 million investment which is the site
11 certificate requirement; actually it's a little
12 bit more than that, and I'll get there.

13 Basically that translates into 2400
14 acres of brushy, nonstock forestlands being
15 converted. And this represents right now about 1
16 percent of the potential of these type of acres
17 that are eligible. So we have plenty of room, if
18 any of you great companies want to get in on this,
19 you can talk to me, we do take investments from
20 corporations.

21 Eighty family forest landowners is what
22 this translates to, average project size about 30
23 acres. And the expectation is that, or the
24 forecast is that this will be equivalent to 1.285
25 million short tons of a carbon dioxide emission

1 offset.

2 So, I want to talk a little bit about
3 where that 1.2 came from. Remember I told you
4 that the total productive capability of the forest
5 is one thing. What counts as the emission offset
6 is another thing.

7 So, in the site council's forecast they
8 only counted roughly 41 percent of the total
9 carbon accumulation or sequestration of these
10 forests over a 100-year period as the basis for
11 the offset.

12 And the reason why they made some
13 deductions were good ones. First of all, there is
14 carbon on these sites, and you know, we have to
15 overcome what's there in order to claim a gain, so
16 that's kind of a baseline issue.

17 The second one is that landowners are
18 not prohibited to harvest under these Trust
19 contracts. They have incentives to hold onto
20 these forests and harvest when the wood is a
21 little more mature than a really early harvest,
22 but they still harvest. And harvest is an
23 emission. You're kind of mucking up the soil a
24 little bit, the wood is going to different places,
25 paper, all that is an emission. So you have to

1 deduct for the fact of where the wood's going.
2 And that was probably the biggest source of the
3 deduction.

4 But at the same time, though, there was
5 a payback; we're structured so we get a payback at
6 that time, and the new acres that that money goes
7 out and plants was counted towards the initial
8 investment.

9 There was also just a risk factor
10 applied for the fact that we're sequestering
11 carbon and these projects are managed over a 100-
12 year period, and they made a 20 percent deduction
13 for that. So that's where we came from, like the
14 total productive capability of the forest to
15 what's counting as an offset.

16 And the only reason why I make this
17 point is that a lot of times you'll look at what
18 the forest can sequester and you'll get all
19 excited. That's not necessarily what's going to
20 be counted. So you need to just be aware of the
21 differences.

22 To put it in perspective of the plant,
23 actually this plant went through design proposals.
24 It's about roughly \$1.5 million, and the 1.285
25 million tons of CO2 offsets is about 3.8 percent

1 of the total emissions of the original size. When
2 the plant got bigger that's when Mike Burnett came
3 to be, and the Oregon Climate Trust came into it.
4 If I do it towards the total, it's about 2.7
5 percent.

6 I had to translate it into something
7 that meant something to me, and I can drive a long
8 way on what we're doing. So, that's good.

9 Okay, I think I'm going to talk just a
10 little bit about -- oh, just real quickly, the
11 expectation is that there will be another raising,
12 another \$1.5 million investment. And actually
13 with our agreement with the project owners, to get
14 some more moneys, and to try to actually get to
15 3.35 million short tons of offset, which is
16 roughly about 10 percent of the original plant
17 emissions.

18 Just in case for those of you keeping
19 score, that's the final finish line.

20 A little bit about the partners. The
21 City of Klamath Falls is the owner of the plant.
22 The operator is Scottish Power Pacificorp through
23 their nonregulatory subsidiary, Pacific Power
24 Marketing.

25 The carbon producer is Oregon Department

1 of Forestry through the Forest Resource Trust,
2 working with landowners, and the motivator, I had
3 regulator, but they're the motivator is the Oregon
4 Energy Facility Siting Council decision, the
5 foresight of the Legislature, and the good due
6 diligence work done by their staff, the Oregon
7 Office of Energy. So that kind of tells you all
8 the people involved that make this happen.

9 Going to flip to the end here. Nobody
10 said it was going to be easy, and the perspective
11 that I'm kind of feeling right now is that when
12 you put these projects on the table, the total
13 asset potential here is a quarter million acres of
14 underproducing land. So that's like, you know,
15 say what we've been looking at is 1 percent of
16 that picture.

17 But the other question is who owns those
18 quarter million acres. How many of those
19 landowners are willing even to talk to the
20 government. Well, that gets rid of about two-
21 thirds of them. The other remaining third, you
22 know, how many of them want to enter into long-
23 term contracts with the state. We provide a
24 certain niche, but the unanswered question, are we
25 dealing with 10 percent of this asset, are we

1 dealing with 1 percent of this asset. And that's
2 really what I need to discover over the next three
3 years.

4 Another way to look at it is how fast
5 can I move this \$1.5 million, and get it to the
6 projects on the ground, and get it to trees on the
7 ground. Our goal is to get it moved within three
8 years, but we actually have ten years to do it.

9 So, in terms of opportunities for other,
10 that will really depend on how well, and our
11 relationships with landowners and fine-tuning the
12 program to get these acres enrolled.

13 Soil carbon is an unknown. I think we
14 do need to do more work on the below-ground carbon
15 accumulation in this forest. We tend to think in
16 terms of the trees. We got that pretty well.

17 Efficiency, these numbers are based on
18 meeting a cost efficiency in terms of the cost of
19 reforestation.

20 Monitoring verification is key. And we
21 also, I feel that we are going to have to justify
22 ourselves in a sustainability type context. What
23 is the environmental, social and economic co-
24 benefits.

25 Things to watch. Okay, I think -- and

1 Mike was the other one -- as you make the right
2 decisions and decide that you want to do carbon
3 offsets, you're going to need to have programs
4 like Mike's and mine and others to receive those
5 funds.

6 And there's some legislation right now
7 that's occurring at the national level. Senator
8 Wyden and Cray are trying to set up state
9 revolving loan programs much similar to the Trust,
10 and provide seed money so all states can take
11 advantage of the under-producing lands in this
12 context.

13 There's another bill by Roberts and
14 Merkowski, Senate Bill 1066, that's looking at
15 carbon offsets and agricultural best management
16 practices, tilling practices dealing with soil
17 carbon.

18 Again, those kind of legislations will
19 create credible programs for you then to meet some
20 of your offset reductions.

21 I went through my summary points, so I
22 kind of just want to leave you with a quote from
23 our Governor, because I think this program and
24 what we've been hearing today is thinking towards
25 the future, I think the strategies that will

1 evolve out of this workshop will provide the need
2 to have more capital move into credible,
3 measurable and verifiable carbon dioxide offset
4 programs. And that's my vision for the Forest
5 Resource Trust.

6 Thank you.

7 (Applause.)

8 MR. SMITH: Thank you very much, Jim.
9 We said initially that one of our goals was to be
10 looking for multiple benefits, and this is a very
11 good example of something that provides those
12 multiple benefits in terms of sequestration of CO2
13 and benefits to wildlife and to the public, as
14 well.

15 Now, I'll introduce Eric Heitz. Eric
16 has been with the Energy Foundation since it began
17 in 1991 and currently serves as its Vice
18 President. He was Project Manager from 1988 to
19 1990 for the TEM Associates, consultants
20 specializing in domestic and international energy
21 projects.

22 In that capacity he managed several
23 projects, including Egypt's New and Renewable
24 Energy Authority to develop wind power. And a
25 project by the U.S. Agency for International

1 Development to encourage electric generation from
2 biomass in developing countries.

3 We're going to hear a little bit about
4 the Energy Foundation's work. Looking forward to
5 it.

6 MR. HEITZ: Thank you. Well, while this
7 thing boots up I hope, I'll take a minute here to
8 tell you a little bit about the Energy Foundation.

9 We were founded in 1991 by the Pew
10 Charitable Trust, the Rockefeller Foundation and
11 the MacArthur Foundation with a two-part mission,
12 energy efficiency and renewable energy.

13 We do that through grant-making. We're
14 a grant-making organization. We support groups
15 nationwide in a variety of areas. Our biggest
16 areas are utilities and transportation, but we
17 also work on renewable energy, buildings and an
18 area we call integrated issues, which tends to
19 focus on national policy.

20 Since our start we've had several other
21 foundations join us. In 1996 the Joyce Morts
22 Gilmore Foundation joined us. And in 1998 the
23 McKnight Foundation joined us. And we're happy to
24 report in the last year the Packard Foundation
25 joined us for two programs. One of which I'll

1 spend some time on today, which is called our U.S.
2 Clean Energy Program. It's focused on climate
3 change and global warming with an emphasis on
4 business.

5 But also on a new China program. And we
6 have now an official office open in Beijing where
7 we're carrying out the fundamental mission of the
8 Energy Foundation, advancing energy efficiency and
9 renewable energy in China. Which, if any of you
10 are interested, we have a couple of guidelines on
11 the China program with us. I'll grab a card and
12 we can get one to anyone else who doesn't have
13 them.

14 This presentation was handed out
15 afterwards. There's some on the table there if
16 people don't have them. Also, if you want
17 guidelines from our grant programs on our U.S.
18 energy programs, there's a stack of those on the
19 table. Or you could see me or Marcus Schneider --
20 Marcus, why don't you raise your hand -- who also
21 might have some copies of those.

22 Let me tell you a little bit about the
23 U.S. Clean Energy Program, which is our newest
24 program, and I'm going to talk a little bit about
25 it now, talk about a few policies and then get

1 back to this program.

2 The goals of this foundation are three.
3 First of all, much like the Pew Center, we are
4 working to secure business commitments to reduce
5 greenhouse gas emissions.

6 Our goals overlap in some ways with Pew,
7 but largely defined by geographic difference and
8 size of company difference. We have a different
9 territory than them, but there's much overlap.
10 And since we're sister organizations, both funded
11 by the Pew Charitable Trust, we work closely
12 together.

13 The second goal is much related to the
14 topic of this very meeting, which is how we build
15 business constituencies to say yes, we do need
16 action, and in fact, what are the policies that
17 can get us there. And that's a goal that -- this
18 is a difficult area for foundations to work on,
19 which is why we're excited to come here. It's one
20 that the nonprofit and advocacy community has done
21 little work in. So it will be interesting to get
22 the advice of folks here. It's one we're excited
23 about, nevertheless.

24 And finally, we worked some on policy
25 modeling and analysis to primarily understand what

1 the economic impacts are of various CO2 policies.
2 And our conclusions, which are the same
3 conclusions that underlie the Energy Foundation,
4 are the central thing I'd like to talk to you
5 about today, which is we firmly believe that low
6 carbon affluence is entirely possible.

7 Take that apart, low - carbon -
8 affluence. We couldn't have asked for a better
9 panel today to underlie that. We have major
10 companies showing that it's profitable in terms of
11 both their energy bill and their productivity to
12 reduce carbon. And that's the central theme of
13 the Energy Foundation, and one that I think
14 California would do well to heed as it thinks
15 ahead in its policy.

16 One of the things I want to talk to you
17 about is the idea that we think the technologies
18 are there now to get to Kyoto scale reductions in
19 carbon and beyond.

20 If you take a look at this chart you'll
21 note that on the right-hand side we have a variety
22 of measures beginning with building and appliance
23 standards, combined heat and power, business
24 commitments, vehicle efficiency, cleaning up coal
25 plants, that's the public benefits charge or the

1 public goods charge here in California.

2 This is a national analysis. It just
3 came out this week from the American Council for
4 an Energy Efficient Economy and the Tellus
5 Institute. And it looks at each of these sectors
6 and says, what carbon reductions might be
7 possible. And you see the blue line up there is
8 what we need to get to Kyoto scale levels.

9 Now, I'm not going to sit here and say
10 that every one of these is going to happen by any
11 means, but what this indicates is that these are
12 entirely possible. And I think the case studies
13 that we've seen here today, and cars like the
14 Prius, make it clear that we can put together a
15 variety of packages that get us there.

16 I'm going to argue further that this is
17 not anything new, this trajectory. If you take a
18 look here, in the period from 1970 to the present
19 there's been a split between the growth in
20 economics and the growth in energy and carbon.
21 And even further, there's been a split between
22 energy and carbon, so the top curve is continued
23 economic growth.

24 Energy is no longer required one-to-one
25 with economic growth. And in fact, carbon is no

1 longer directly linked to energy.

2 And what we're about, I think, as a
3 group here today, is how do we get those to split
4 apart further. And how do we continue to get the
5 kinds of savings that we've already received from
6 this kind of split.

7 Those savings, \$170 billion annual, are
8 if compared to, if we had stayed at the old
9 linkages we were at in 1950. So you can see
10 clearly that we're on a good trajectory.

11 Let's apply that and project that
12 forward. Here's the energy intensity of the U.S.
13 economy to present. Here's where it needs to go
14 to get to Kyoto scale targets.

15 If you take the average reduction per
16 year in energy intensity and you just project it
17 forward, that's where we need to go for Kyoto.
18 Now, of course, I would remind you, as the Pew
19 Trust Center might remind you, that the science
20 suggests we should go well beyond Kyoto if we want
21 to stability carbon and stabilize temperature.

22 So this is a good start, but the point
23 is this can be done without economic -- with small
24 to positive economic impacts.

25 Let me talk about a few priorities with

1 respect to California. Before we do that, let's
2 remind ourselves where carbon comes from in
3 California. Transportation is by far and away the
4 largest chunk.

5 Now this does not show out-of-state
6 power plants. If you add out-of-state power
7 plants, electricity goes up to about 26 percent,
8 and transportation drops to around 46 percent. I
9 think those are correct. So, clearly in two big
10 chunks are electricity and transportation. And
11 then industry.

12 I'm not going to mention today Title 24,
13 which is California's building code, which I think
14 is one of the best -- the best building code in
15 the country. Because that seems to be going along
16 well. I would only note for all of you that that
17 is a very powerful agent in terms of getting to
18 residential and commercial use, which is largely
19 building focused.

20 But what I want to do is talk about a
21 couple of policies, just a note there, we're 12th
22 in the world. If you add the out-of-state power
23 plant emissions we're 8th in the world in
24 California in carbon emissions.

25 One thing I often get tired of hearing,

1 and I'm a native Californian, born and raised, and
2 have some pride in our leadership in the past, I
3 get tired of hearing this sentiment that we gave
4 at the office, we've already reduced our CO2,
5 we're below the rest of the country so therefore
6 we shouldn't do any more.

7 This just puts California in an
8 international context. The third bar over is
9 California. You can see we're quite a bit better
10 than the U.S. average in terms of metric tons of
11 carbon per capita, but we're significantly below
12 some major industrial powers overseas.

13 And if you look at the world average, on
14 the far right-hand side, we're way above that.
15 What credible political grounds do we have to
16 stand on to say that there should be vast carbon
17 reductions overseas if we don't do something on
18 our own front.

19 And as we'll discuss, I'm sure, at the
20 panel later and that will be part of the
21 conclusion I would have, is California has enjoyed
22 leadership in these areas. And are we going to
23 continue that, or are we going to squander that
24 leadership. That's the question I would pose.

25 But let me talk about three priorities

1 that we would toss out for discussion. One has to
2 do with transportation, the second with utilities,
3 and finally we'll get back to the business, what
4 are some of the business ideas for reducing
5 greenhouse gases.

6 I just can't resist, given the timing,
7 of a short discussion about advanced vehicle
8 technologies. We had the perfect introduction to
9 it today with the Prius. These are the kinds of
10 technologies that are possible. We would argue
11 that it's been the intelligent emission regimes
12 offered by the California Air Resources Board that
13 drove the kinds of investments that made cars like
14 the Prius delivered to us tomorrow, or May '98.

15 And worldwide, the discussion of Shell
16 didn't mention that Shell invested half a billion
17 dollars in the fuel cell off a spin-out. Ballard
18 has over a billion dollars in investments from
19 major car companies, a Canadian fuel cell
20 manufacturer. These are driven by health-based
21 regulations where people say we want cleaner cars.

22 This is a calculation that needs to be
23 worked out in even more detail, but our rough
24 estimates are that every one mile per gallon
25 improvement in the fleet in California is a

1 million metric tons of carbon saved. If you
2 remember, California's about 100 million metric
3 tons. One mile per gallon, 1 percent improvement.

4 The Toyota Prius is significantly, it's
5 in the 20 to 30 percent improvement. It's the
6 first edition of fuel efficiency. So, again,
7 remember the portion of the bar on the
8 California -- portion of the pie chart on
9 California that is related to transportation.

10 I would argue that the goals, one, we
11 have to maintain the zero emission vehicle mandate
12 that is going to be debated this coming year
13 before the California Air Resources Board. And
14 many oil and auto companies, none of whom are here
15 today, will be fighting that tooth and nail.

16 Second, and this is for further
17 discussion later in the day, I think, what are the
18 ways we could jump-start the market to help
19 leading companies like Toyota or others who come
20 out with advanced vehicles. What are the means we
21 could incent customers, we could incent
22 businesses, or incent government purchasing,
23 fleets, et cetera.

24 Electric utilities. This is another
25 very politically hot topic in California. Many

1 suspect that next year the debate will be in place
2 over the continuation of the public goods charge
3 which you heard about today from several
4 companies, had helped them to audits and other
5 efficiency measures.

6 This is a charge that supports public
7 benefits programs over the last four years,
8 actually it's from '98 to 2001, it's about 880
9 million for efficiency, and 540 million for
10 renewables. This is where the California Energy
11 Commission administers the renewables fund, the
12 Utility Commission administers the efficiency
13 fund. But it expires, as I suggested.

14 Now, the Board for Energy Efficiency
15 just came out with a net benefit analysis for 1998
16 spending alone of just the efficiency program.
17 And their determination was that it was over 200
18 million in net benefits, 236 million in net
19 benefits.

20 We haven't even explored yet, and the
21 CEC is working on this, and there's some national
22 forums that are working on it, how do we quantify
23 the reliability benefits in areas that are
24 constrained, San Diego being one of the foremost.
25 How do we quantify these reliability benefits from

1 these programs.

2 And then just to point you to something
3 that I think is a very much business-oriented
4 policy that has emerged out of this kind of
5 funding, and this is the reverse auction. This is
6 the idea that you challenge a business sector to
7 come up with the lowest cost way to meet a certain
8 goal. And in this case they did it with renewable
9 energy, and to everyone's surprise, I think, the
10 average price of a renewable -- of actual
11 renewables was 1.2 cents a kilowatt. Very small
12 extra percentage.

13 And this was because developers were
14 allow to bid for the lowest extra increment it
15 would take in order to put in renewables.

16 Now, in China we have people asking us
17 about the reverse auction and how did it work and
18 so on. I think there's been quite a bit of
19 publicity around this concept as a way to very
20 cost effectively spend what is effectively a
21 public subsidy.

22 So we argue we need a ten-year extension
23 of efficiency funding. We need to -- this is an
24 area that I didn't dig into, but we need to avoid
25 regulatory incentives that reward the distribution

1 utilities for through-put.

2 Think about that for a second. If PG&E
3 and Southern California Edison and San Diego Gas
4 and Electric, who are selling off their power, are
5 going to move toward being distribution entities,
6 if they're rewarded every time you or I, as
7 customers, or every time a business buys a
8 kilowatt hour, guess what they want to do. Sell
9 more kilowatt hours. That's antithetical to
10 California's carbon reduction goals, and to many
11 of the carbon reduction goals the businesses here
12 have talked about.

13 So this is up currently. It's coming up
14 now, and it's something that's not getting enough
15 attention, I think.

16 And, finally, business and government
17 commitments to buy green power. You've seen a lot
18 of it today. We need to make it easier for that
19 to happen in a lot of ways.

20 So turning to the business
21 opportunities. One of the things that has been
22 the central sort of piece of our Packard program
23 was to help launch the Center for Energy and
24 Climate Solutions, which is the next speaker on
25 the panel, so I won't steal their thunder.

1 I just want to point to their book which
2 everyone should read, if they haven't already,
3 which is a great compilation. It's like sitting
4 down and doing what we did today, but doing it in
5 a book with lots of facts and figures. It's an
6 excellent book.

7 And its underlying premise is that not
8 only the energy savings, but the productivity
9 gains from doing the sort of analysis that we
10 talked about today, are going to be an area of
11 tremendous financial gain for the best companies
12 of tomorrow.

13 And here's a chart we like, it just kind
14 of helps get this across. If you look, here's
15 your average return on this axis, and the risk
16 coefficient, how risky is this investment as based
17 on its coefficient of variation. And you can see
18 up at the top the red diamond. That's an Energy
19 Star building investment.

20 But you look out on the side, the Latin
21 American composite is the yellow box. Very high
22 risk, but fairly high return. If you look in the
23 middle there's a number of things. And then down
24 at the bottom, short-term bonds, which are very
25 low risk, very low return.

1 Energy efficiency, if you look at it
2 within the context of other investments, has a
3 great risk profile, which is, I think, why some of
4 the CEOs of these companies are very interested in
5 it, notwithstanding great PR benefits.

6 In terms of business sector goals, we
7 would toss these out for discussion in the panels
8 that emerge. It strikes us that there's a role
9 for California to reward early adopters. And
10 there's a lot of different possible suggestions
11 for how to do that.

12 But certainly we don't want to set a
13 situation up where at some future legislation
14 those who went early are somehow hurt. And that
15 happened with the sulfur oxide trading system. So
16 we should be wary of that.

17 Second, there's a role to do what both
18 the Pew Trust is trying to do, the Center for
19 Climate Change and what others are trying to do in
20 their work, and that is the industry needs to
21 understand benchmarks for each of its different
22 areas. Am I doing well, am I doing poorly with
23 respect to that benchmark. And that is a possible
24 role for government.

25 And, finally, developing business

1 oriented clean energy commercialization programs.
2 All too often our R&D that's publicly funded ends
3 up doing esoteric stuff that doesn't help those
4 leading edge businesses who are trying to
5 commercialize technologies. There's some good
6 work making that better, but we need to improve
7 more on it.

8 So let's summarize. In the past
9 leadership, driven by policy, has resulted in the
10 cleanest cars in the country, the cleanest
11 electric utilities, most advanced building codes,
12 and research and development that has created some
13 of the key technologies for carbon abatement.
14 Renewable energy, efficient lighting, compact
15 fluorescents, for example, efficient windows,
16 cogeneration, that early development.

17 And the result is that we have 35
18 percent less carbon output per dollar GDP. And
19 billions in energy savings.

20 Where are we going to go in the future?
21 We would argue that we have to begin to integrate
22 our energy and clean air policy. Sorry, say that
23 again, integrate clean air and energy policy.
24 CARB is driven by clean air mandate, but it just
25 so happens that the way those regulations have

1 worked have also driven serious investments into
2 cleanest automobiles. So we need to integrate
3 those two.

4 We need to maintain our leadership.
5 This is slipping, you know, in the wind category
6 for example, we were long time a leader, it's
7 slipping. We need to maintain it and create those
8 market opportunities. And, as a result, we'll get
9 billions in energy savings.

10 Thank you very much.

11 (Applause.)

12 MR. SMITH: Thank you very much, Eric.
13 Your point is particularly well taken about the
14 value of the close working relationship of the
15 California Energy Commission and the California
16 Air Resources Board with Jim Boyd's help, the two
17 agencies are getting together regularly to talk
18 strategy and program directions.

19 I'd also like to thank you generally for
20 the work of the Energy Foundation. It's extremely
21 valuable in not only participating in sessions
22 like this, but bringing policy and business people
23 together. Appreciate it.

24 Next it's my very great pleasure to
25 introduce Arthur Rosenfeld. Dr. Rosenfeld is a

1 Senior Adviser to the Assistant Secretary for
2 Energy Efficiency and Renewable Energy at the
3 Department of Energy.

4 He's also Director of the Center for
5 Energy and Climate Solutions. As a professor of
6 physics at the University of California Berkeley
7 since 1963 he founded and directed the Center for
8 Building Science at Lawrence Berkeley Lab. He
9 founded and held several posts with California
10 Institute for Energy Efficiency.

11 He is the cofounder of the American
12 Council for Energy Efficient Economy. Served as
13 Chairman, President and Board Member.

14 Dr. Rosenfeld has authored many
15 scientific papers and four best selling books. He
16 has received several national awards for his
17 efforts in promoting energy efficiency. Won
18 "Discovery" magazine's 1996 environmental award of
19 the year.

20 We had a little bit of an introduction
21 to one of the latest collaborations he has been
22 involved with, which is with Dr. Joseph Romm,
23 which resulted in the book, "Cool Company."

24 Art.

25 DR. ROSENFELD: And you've all seen my

1 jacket.

2 (Laughter.)

3 DR. ROSENFELD: You can stay standing
4 up, it's okay. Kent probably confused you
5 slightly by saying that I am at the Department of
6 Energy, and that I'm also just joining this new
7 Center for Energy and Climate Solutions. And
8 that's because December is my transition month.
9 I'm using up my vacation at DOE while I pack up.

10 I'm going to do a little bit of what
11 Eric did, that is talk about some general issues
12 in California. Maybe that will provoke some
13 discussion during the later panel when we're
14 supposed to be discussing what should California
15 do.

16 And then I will make a few remarks about
17 some things that are in this book which Eric
18 kindly advertised.

19 I got my data on California, just to
20 show how great we are, from the Energy Commission,
21 itself, from Tom Kelly. And I realize that I
22 forgot, in fact, to get straight this ticklish
23 issue of out-of-state coal. So these figures
24 could be 1 percent off because of that.

25 The point I want to make is, darn it, we

1 are doing something right here. And just last
2 night when I made these things up, I decided to
3 make two comments. The first one is the black
4 line is United States energy per capita. And you
5 can see when the Arabs woke us up in 1975 the
6 United States was using about 8, and then this
7 hard-to-see yellow line here, but you can see it
8 on the handouts, is California, and we were
9 already better by -- we were a 7 instead of 8.
10 And that's because we have a milder climate
11 basically.

12 By the year 2000, and welcome, that's a
13 month off, we will be -- the United States will
14 have climbed to this, California will have stayed
15 level. And if you put presenting funding in, even
16 without, I believe, including the public benefits
17 funding, the United States by Kyoto date, or 2015,
18 actually, it's the last five year, will grow to
19 14, California should be deal level at 7.

20 In terms of how does that reward our
21 pocketbook. At an average of 10 cents a kW hour,
22 this is electricity, I'm sorry, not energy, this
23 is \$1400 per capita or about \$3000 a family for
24 the United States, and California will be at half
25 of that, \$700 per capita, \$2000 a family. That's

1 a substantial economic shot in the arm. So we
2 should feel pretty good.

3 The next remark I want to make here is I
4 looked up total energy last night, and to my
5 amazement, happy surprise and so on, it turns out
6 that in this whole time since 1990, which was a
7 baseline for Kyoto, total primary energy use in
8 California has stayed level give or take .6
9 percent.

10 So, again, I don't know, I'm like Eric,
11 I don't know what the conclusion is. We got a
12 long way to go compared to the world, as a whole,
13 or France, but the amazing thing is right now
14 we're on target to meet Kyoto, which I think is
15 pretty gratifying.

16 And somehow or other, in terms of the
17 rest of the world and Senator and Hagel and
18 everybody who got mentioned, you know, it should
19 be possible to meet Kyoto considering that one
20 state has already inadvertently done it.

21 (Laughter.)

22 DR. ROSENFELD: If you look at kilowatt
23 hours, this is still electricity, per dollar of
24 gross state product or gross national product,
25 we're doing even better because we're a wealthy

1 state.

2 So in principle we have more money to
3 spend for gasoline, for SUVs and so on, and yet we
4 started off 28 percent better than the United
5 States as a whole, but we're now 46 percent better
6 than the United States.

7 So, whatever we're doing, Kent, has been
8 adding 1 percent a year to our productivity.

9 And if you take natural gas, here it
10 happens to be plotted in units of population going
11 up and natural gas going down, so this isn't Kyoto
12 units of absolute primary energy. And heck, we've
13 already beat Kyoto, that is beat the level by like
14 10 or 15 percent. Despite a trend of burning gas
15 in power plants.

16 Now, again, Eric and I seem to have the
17 same interest, and say a little bit the same
18 thing. How effective have public benefits money
19 been.

20 Well, I've been out of the state for
21 five years, so my data aren't as up to date as
22 Eric's, but I do want to present the extreme cost
23 competitiveness of the programs that I watched
24 while I was in Berkeley until 1994.

25 As you remember, we had the California

1 Collaborative, under which for four years
2 utilities could make much better profits by
3 sharing savings with their customers than they
4 could by selling this expensive stuff called
5 electricity.

6 And the way I used to say it is the same
7 utilities who before the California Collaborative
8 used to lie, cheat and steal to sell more
9 electricity were so motivated that they lied,
10 cheated and stole even more effectively to save
11 the customer money when we had the sense to make
12 that more profitable for them.

13 Well, because customer dividends,
14 because utility stockholder dividends were at
15 stake, all these programs were pretty well
16 audited. And there are two numbers I can quote.
17 From the point of view of the utilities, over the
18 investment of half a billion dollars, which is a
19 pretty big set of programs, the actual cost of
20 avoiding kilowatt hours 1.6 cents. And I think
21 considering that the average cost of power was 10
22 cents, the idea that you could avoid it for 1.6
23 cents is pretty impressive.

24 If you take all the costs including the
25 expense of running the programs and what the

1 customer had to put in, because the customer had
2 to do some matching, this is nationwide, not
3 California report, by Joel Edo at LBL on the, I
4 think, 15 largest programs, the cost of an avoided
5 kilowatt hour was still only 3.2 cents.

6 So the typical payback time was like two
7 years. And I assert that our new power plants,
8 even fancy gas-burning power plants, you don't get
9 your money back in two years.

10 I want to make one last sort of dramatic
11 result. Again introduced somewhat by Eric. We
12 shouldn't be scared just to adopt standards,
13 enforce standards. Eric did a -- on Title 24.
14 The year I left California, which was in 1994, the
15 Energy Commission issued a statement that the
16 savings in buildings of electricity because our
17 buildings are more efficient, because of Title 24
18 was, thank you, \$1 billion a year in electricity,
19 and a half a billion dollars a year in natural
20 gas.

21 Here's my last remark on that, and this
22 is the story of California which had the courage
23 to adopt refrigerator standards the first of
24 anybody in the world in 1974. And I'd like to
25 give you a couple astounding results from this, or

1 a couple of morals.

2 This is a scale for 1947 to the year
3 2001. 2001 because the newest federal standards
4 will now become effective in July 2001. The dash
5 line here shouldn't confuse you, it's the growth
6 in the volume of refrigerators during all these
7 years, starting off at 8 cubic feet in 1974,
8 climbing to 18 cubic feet in 1975, the year we
9 introduced the standards, and then leveling off.
10 Not leveling off because of affluence, but just
11 the damn things won't go through the kitchen door
12 anymore, so they've leveled off.

13 (Laughter.)

14 DR. ROSENFELD: Okay. Now, here's the
15 energy use. Less and less insulation so you could
16 have bigger interior space and less exterior
17 space. Crummier and crummier motors because they
18 will be lighter and cheaper. Energy use went up
19 from 400 kilowatt hours a year to 1800 kilowatt
20 hours a year, and was growing 9 percent a year.
21 And supposedly that was the way the future was
22 going to go, when the Arabs woke us up one October
23 afternoon.

24 Very shortly the Federal Trade
25 Commission got appliance labels going, which was

1 pretty impressive. And I personally had the
2 pleasure of convincing Governor Jerry Brown that
3 if he introduced refrigerator standards, pretty
4 mild standards, the first ones, he could cancel a
5 new, called Sun Desert, which was the last one
6 waiting to go on. And he liked that idea, so
7 pretty soon we had appliance standards.

8 This is the most dramatic right-hand
9 turn in history, I believe. You might call it a
10 skid. Refrigerator use has now come down. And
11 one of the points I'd like to make is it has come
12 down on the average 5 percent a year every year
13 for 27 successive years. Or put another way, the
14 standards have always been adopted whether they be
15 state or whether they be federal, on roughly a
16 three-year payback.

17 But a three-year payback in 1987 turns
18 out to be kind of naive compared to now, or put
19 another way, low growing fruit has a tendency to
20 grow back the next season.

21 (Laughter.)

22 DR. ROSENFELD: Now, what are the
23 economic implications of this. I want to go to
24 the right-hand side, not California, but the
25 United States as a whole. There are 150 million

1 refrigerators plus freezers.

2 If we had just leveled off we would, at
3 the present moment, be using 55 big, really big,
4 huge, 1000 megawatt power plants. We don't build
5 them that big anymore, but I think Rancho Seco was
6 like 900 megawatts. So these are sort of like
7 U.S. wide, 60 Rancho Secos.

8 Instead, by the time the new standards
9 come in in 16 years for them to take over, we will
10 be down from 54 1000 megawatt power plants to 14.
11 That's a saving of 30 or 35 Rancho Secos.

12 What is the value of the electricity
13 saved? It turns out to be about \$16 billion a
14 year. Which no one even notices because the
15 refrigerators are a little bigger, they don't run
16 UCFCs anymore, they do all they used to do,
17 they're just using \$16 billion a year less
18 electricity.

19 What is interesting to compare with \$16
20 billion. This amount of money here corresponds to
21 one-third of the total output of civilian nuclear
22 power plants in the United States. But there's an
23 interesting point. When you save money at the
24 meter you save it in California, 12 cents a
25 kilowatt hour.

1 The nuclear plants, however, can only
2 sell it at the buss bar wholesale, for which the
3 average price last year was 2.5 cents a kilowatt
4 hour. And interesting factor of 4 less.

5 So you end up with a rather remarkable
6 result that refrigerator standards in the United
7 States are now saving more money per year than the
8 value of nuclear power sold last year in the
9 United States. That seems to tell me and Eric, I
10 guess, that there's something in the standards
11 game.

12 Okay, so that's unfortunately 12 minutes
13 out of my 15. Don't worry, I'll quit.

14 I do want to say a couple words about
15 this book, mainly that it's a very good, it's a
16 very thorough book. It's hard to take notes on,
17 all the wonderful things you heard today, but if
18 you want 500 footnotes and websites and so forth,
19 order this and if you get it, remembering one
20 word, Romm, and going to www.amazon.com.

21 My handout has a few pages saying that
22 people are now taking -- many people, many
23 companies are now taking energy efficiency very
24 seriously. I will, I think, show the first couple
25 of transparencies. Just mentioning a few examples

1 that weren't talked about today.

2 Part of the problem with my handout is
3 it's redundant with some of the stuff which was
4 said today, of course.

5 Here's Xerox in Palo Alto, which claims
6 it's already saved 50 percent of its energy.
7 Energy Star buildings were mentioned by Eric as
8 being a wonderful investment. Quantitatively, on
9 the average, Energy Star showcase buildings with
10 Energy Star seals from EPA/DOE are saving 30
11 percent on their energy. And, of course, Eric
12 just told you, a very good handsome return on
13 investment.

14 Texas A&M does something which
15 California ought to follow. Here's one specific
16 suggestion. Texas has \$100 million rotating fund
17 which they got from oil overcharge money, which we
18 used to administer. And they're using it for
19 retrofit. It's zero interest, four- to ten-year
20 loans.

21 But what they've learned to do is have a
22 third party commission these buildings so as to
23 make sure that you really get what you pay for.
24 Which, in general, you don't when you get a
25 retrofit.

1 It also keeps the buildings tuned up.
2 Right now, on the average, they are saving 25
3 percent on all of the state buildings in Texas,
4 including school boards and so on, schools, and
5 their return on investment is 70 percent.

6 Here's another small company, we've been
7 usually big companies today, Verifone in southern
8 California, got a 60 percent cut with more than --
9 with a productivity gain of 5 percent. You will
10 find on the subtitle for this book, it's not just
11 energy efficiency, there's some analysis of losses
12 in sick leave and increases in productivity, which
13 always turn out to kind of swamp the energy
14 savings.

15 And so there they got a productivity
16 gain which gives them like a one-year payback.
17 Well, this is supposed to be sort of a motivation
18 for reading the book. We're going to have some
19 more time pretty soon on the panel in which we
20 discuss other things that California should be
21 doing, and I'll get a few words in then.

22 Thank you very much.

23 (Applause.)

24 MR. SMITH: Art, thank you for not only
25 your presentation, but for a good many of the

1 things that we all need credit for as
2 accomplishments these days.

3 DR. ROSENFELD: Thank you, sir.

4 MR. SMITH: This ends the first part of
5 the program, consisting of the presentations. I'd
6 like to thank each one of the speakers for making
7 my job very very easy today. Appreciate very much
8 the effort that went into that.

9 We're going to shift to the panel
10 discussions. And for the remaining part of the
11 presentation our Deputy Director for Technology
12 Development, Nancy Deller, will facilitate the
13 discussion and the remainder of the workshop.

14 Nancy is a person who has worked at the
15 Commission as an Adviser to Commissioners, and as
16 a Deputy Director on the technology side for a
17 number of years. She's been responsible for
18 leading a number of the Commission's
19 transportation initiatives and clean fuel
20 initiatives.

21 Nancy.

22 MS. DELLER: Hi. I'm going to echo
23 Kent's comments that this has been very very
24 interesting, really enjoyed hearing everything
25 that each of you individually has said. And now

1 you get to talk as a group, and to focus on some
2 issues.

3 And this is where I get to say, we're
4 from the government and we're here to help, and
5 hopefully you'll take that seriously.

6 We've broken the panel up into, or the
7 presenters up into three different panels, and
8 we're going to be asking each of them to talk as a
9 group about two questions, responding to two
10 questions that I'll put upon the Vugraph in a
11 moment.

12 And after each of the panels has had a
13 chance to talk about that, I think we'd like to
14 open it up to the audience and have some Q&A with
15 the participants, and the other participants, the
16 other presenters who aren't necessarily on the
17 specific panel that's talking at the moment. You
18 may want to ask some questions, too.

19 We have about 45 minutes for each panel,
20 and with that, I'll introduce Bud Beebe again, who
21 will be doing our first panel, which will be
22 focusing on energy and transportation.

23 Okay, the two questions. Maybe I should
24 read them. What steps should California take to
25 build a consensus among business, industry and the

1 other stakeholders on policies that should be
2 adopted to reduce greenhouse gases and address
3 potential climate change impacts.

4 Obviously we're trying to find out here
5 how can we work together as a group and obviously
6 have more influence and power than we would as
7 individuals.

8 And then how can California State
9 Government policymakers assist companies to reduce
10 greenhouse gas emissions and address potential
11 climate change impacts on the state's environment
12 and economy. What can we do to help you
13 specifically or companies like you.

14 So I'll turn it over to Bud.

15 MR. BEEBE: There are four of us who
16 have been grouped together in the transportation
17 and the energy group. And they're the three
18 gentlemen on the left side of the table, the long
19 table here.

20 We have Don Cunningham, again from
21 LADWP; we have Michael McAdams from BP and all of
22 those other companies that you've joined with
23 lately; and well, you know, -- Dave Hermance from
24 Toyota. And I'm again with SMUD, the local
25 electric utility.

1 And just to begin this by noting some
2 interesting connections between these otherwise
3 diverse things called energy and transportation,
4 BP does photovoltaics and so does SMUD. We don't
5 happen to use a lot of BP's photovoltaics, but
6 we'd like to use more of them.

7 So, that's an interesting conjunction of
8 traditional different kinds of energy people
9 beginning to come together in a new age
10 convergence.

11 And Toyota and LADWP are down in the
12 same area down there in southern California
13 mostly, and I think that that's interesting, too,
14 because some of the stuff is geographic.

15 So, just beginning to look at some of
16 this stuff, maybe what we could do, Don, if you
17 would lead off by giving some perspectives on how
18 you would deal with these two particular issues.
19 Then we'll follow that with Mike McAdams and with
20 Dave, and then perhaps myself.

21 And please, what we're going to do is
22 just do this real quickly, so that we can have
23 audience interaction with each of the four of us
24 if possible. Okay?

25 MR. CUNNINGHAM: Well, this is, I think,

1 the first time in my career that this has happened
2 to me with one of these panel things where I
3 actually get to go first. Usually I have four or
4 five points I'd like to make, and well, that guy
5 made that point, this person, she made that. And
6 I just want to say everything everybody else said.

7 I'm going to keep my comments very brief
8 and just touch on a couple of what I think the key
9 issues relative to the first step in terms of what
10 steps the state should take in an attempt to build
11 consensus.

12 I think the most important step as in
13 just about any journey is the first one. And I
14 think that's really the step we're taking today.
15 I think the first real step towards building
16 consensus is developing this kind of open and
17 collaborative dialogue among industry and all the
18 affected stakeholders.

19 I think California industry employs so
20 many bright and creative people that if the state
21 can provide the direction and coordination, and
22 then we turn those bright, creative minds loose,
23 we can develop solutions that can have broad-band
24 applications.

25 We've heard a lot today, gee, what works

1 in this industry doesn't work in that industry.
2 What works at this facility doesn't work at that
3 one. What works in this building doesn't work in
4 that one.

5 By collaborating and pooling our
6 resources and our experience and our skills, I
7 think we can develop the really broad-based
8 solutions.

9 One other thing that I think really
10 needs to be thrown into this mix of government and
11 business, industry and the other organizations
12 that are here today, is education. I've heard a
13 couple of people comment about raising public
14 awareness. And I think primary, secondary
15 education curriculum is a key way of communicating
16 and raising public awareness.

17 And the involvement of colleges and
18 universities. I mean, the example you heard the
19 reed project at the winery that grew out of a UC
20 Davis graduate study. That's a perfect example of
21 the kind of, you know, research and new
22 intellectual, bringing new intellectual properties
23 into this whole mix that are just tremendously
24 valuable.

25 Those are really the primary points I

1 wanted to make. I can turn to the rest of the
2 group.

3 MR. BEEBE: Okay, Mike, why don't you go
4 ahead.

5 MR. McADAMS: Okay. I was struck by --
6 and I'm really looking forward to engaging with
7 the audience here, I was struck by the word
8 consensus here, because I find an irony in the
9 word consensus. I think at the end of the day,
10 one, we really solved this problem. What we're
11 going to find is that we agree that we all did it
12 differently.

13 And so I think the process is one that
14 is important, in and of itself, because I think so
15 many of the things that we're going to discover on
16 our journey of solving climate change, and this
17 has happened for our company and the employees in
18 our company from the different units, have cross-
19 application. And it may not be literal
20 application; it may not be a one-to-one ratio. It
21 may be a 33 percent ratio. But, the whole concept
22 that we're going to reach a consensus where we're
23 all going to happily walk in lock step, auto
24 companies and oil companies and environmental
25 groups, I think is a bit of stretch, given what

1 I've seen in public life.

2 But I think --

3 MR. BEEBE: We'll buy, we're going to
4 buy some of your photocells, so don't worry --

5 MR. McADAMS: But I think just the fact
6 that we can sit down as adults, and that's one of
7 my favorite phrases, and have an engagement with
8 each other, and listen and have an exchange is an
9 incredibly important thing.

10 The second thing I think that
11 governments have the ability to do is lend
12 credibility, to legitimize some of the things that
13 we do very well in the business community. And
14 our role in the business community is to develop
15 and deliver consumer services of value and
16 products of value to all of us, the customers.
17 And we're all consumers, whether we work in
18 business or in government, we're all enjoying
19 these different products and different services.

20 And I think one of the things that
21 governments really need to understand, and
22 California government in particular, given your
23 reputational heritage, is the credibility you lend
24 by coming up with some concept of putting the
25 badge of approval on it, a seal of approval.

1 And I bring that for consideration. And
2 it could come in many different shapes and forms,
3 because one of the great things that we've learned
4 in our partnership with the Environmental Defense
5 Fund in being our transparency mechanism, for some
6 reason people around the world were a little
7 suspect about an oil company, a foreign oil
8 company, telling them what our emissions were and
9 what our emissions reductions were.

10 But we found a wholly different
11 experience when The Wall Street Journal
12 interviewed Dan Dudack with the Environmental
13 Defense Fund, and Dan said, let me tell you how
14 they got those numbers and what the modeling was,
15 because I helped design it. I sit on the Climate
16 Change Committee in BP Amoco's headquarters, and I
17 helped design it, as a full participant in their
18 process.

19 And I think that is an option that the
20 California government ought to consider is ways in
21 which you can lend to the process and give a badge
22 of approval. Or some kind of reputational
23 benefit.

24 The third thing I would like to say is
25 the education, I have to reiterate, is so

1 important. Not just in terms of educating, as our
2 esteemed colleague down the table has done, in
3 terms of the actual fact patterns and number of
4 emissions you have, and where those emissions are
5 located. But educate the public of the varying
6 quality of the products and services that are out
7 there.

8 Let me give you another anecdotal story.
9 We introduced the cleanest gasoline voluntarily in
10 the City of Atlanta. Atlanta has a major air
11 quality problem, and we, in July, introduced the
12 first 30 ppm low sulfur gasoline in the State of
13 Georgia.

14 In the UK we introduced the first low
15 sulfur diesel. We went to Paris and introduced
16 the first low sulfur diesel. Different solutions
17 for different cities because they required
18 different issues.

19 In each one of those areas, in each one
20 of those cities around the world, we had
21 government officials help quantify and help tell
22 our public about what we were doing with our
23 product slate. And giving them the choice, again
24 through a third-party intermediary.

25 In Chicago it was the equivalent of

1 taking 50,000 automobiles off the road every day.
2 In Atlanta it was the equivalent of taking 17,000
3 cars off the road every day. And the same kind of
4 images we painted in Paris and the UK.

5 The last one I want to make is there is
6 an absolute convergence, and if you talk to the
7 Secretary of Energy, or you talk to the
8 Administrator of EPA, many of them wonder who
9 really runs energy policy in the United States.

10 And if you sit down with the senior
11 leadership in my industry, they have the same
12 question. And so as the State of California seeks
13 to try to provide constructive guidance in this
14 challenging area, there has to be an
15 acknowledgement of the overlap between the statute
16 base and the customer issues between energy
17 policy, clean air policy and climate policy. It's
18 not independent.

19 We have had a number of discussions with
20 our friends in the auto world. We're very lucky.
21 Our chairman sits on the board of Intel. And we
22 learned a lot about technology and consumer
23 services, people buying a chip they never see.
24 That taught us something about putting gasoline in
25 a car, because people never see the gasoline.

1 He also sits on the board of Dahmler
2 Chrysler, and we had to acknowledge, and one of
3 the first frankly energy companies to do so, that
4 really our number one customer was the auto
5 industry.

6 Now, for a lot of folks in the oil and
7 gas industry that's a big leap to take. But I
8 would, you know, again use that illustrative, as a
9 different way to view things, and as a different
10 way to show partnerships.

11 And when you look at climate change and
12 you look at my friends, my colleagues' challenge
13 with respect to what kind of auto he's going to
14 put on the road, well, we're now, for the first
15 time, having open discussions about fuel systems
16 and auto technology systems working in harmony as
17 one. Not as independent industry fighting over
18 who's going to spend the capital, or who's not,
19 but how we're going to come together.

20 And governments ought to help create
21 that atmosphere. My hat's off to the Department
22 of Commerce for the PNGD program and the Vice
23 President's leadership in that area.

24 Help us come together and strip away
25 those long tenured biases and judgments so that we

1 can move forward and find new solutions.

2 And I'll stop.

3 MR. BEEBE: No, that's good, that's
4 good. And, you know, you're obviously a very
5 strong proponent and a good salesperson for these
6 types of approaches. And I like the way that you
7 addressed your friend and colleague, Dave, after
8 just having described him as your customer.

9 (Laughter.)

10 MR. BEEBE: But that's good, that's
11 good. That shows the interactions, really.

12 Dave, what are your thoughts on these
13 things?

14 MR. HERMANCE: Well, --

15 MR. BEEBE: And we have a full five
16 minutes there.

17 MR. HERMANCE: -- a caveat first. I'm an
18 engineer, not a policymaker. But, I've been
19 engineering in the area that's heavily regulated
20 and governed by policy for a long time. So, I
21 will go ahead and offer some observations. But
22 policy is not my area of expertise.

23 I'll reiterate something that was
24 mentioned more than once, because some of my
25 friends in -- not in the oil industry, they

1 understand this completely -- but some of my
2 friends in the environmental community, and I know
3 that sounds like oxymoronic for an auto
4 manufacturer to talk about friends in the
5 environmental community, but we actually have some
6 and we're gaining more. And the only way we're
7 going to move forward is to make them our friends,
8 and to better understand each other's positions as
9 we go forward.

10 But one thing that's not yet fully
11 understood is that our products must be desired by
12 the customer. They must meet very high
13 expectations not only for functionality and
14 reliability, which are the basic keys to getting
15 in, they've got to be fun.

16 We have spoiled the motoring public for
17 a long time, and they won't tolerate backing away
18 from the fun to drive aspects of the
19 transportation they today enjoy.

20 Clean technologies, which are less
21 desirable products, won't sell in volume. We'll
22 sell a few of them. And maybe we need to sell a
23 few of them in order to get over the edge. But
24 they won't sell in volume, and only volume sales
25 will turn over the fleet. And only the turnover

1 on that fleet will significantly impact air
2 quality. Either from smog precursors or for
3 reduction of -- or for lowering the CO2.

4 And now I need to --

5 MR. BEEBE: And what the heck is the
6 purpose of a panel if we don't have a little
7 controversy.

8 MR. HERMANCE: Command and control for
9 fuel economy may not be the best solution. It's
10 probably going to be less effective than some kind
11 of market-driven process.

12 I don't have a handy one to give you,
13 but CAFE has been somewhat ineffective. No, it's
14 been a whole lot more than somewhat ineffective.
15 It's been pretty significantly ineffective. And a
16 lot of folks recognize that.

17 We need some alternative to stimulate
18 the market to want to do the right thing. Now,
19 one other thing, I know it's going to get me
20 crosswise with at least one other person at the
21 table, the focus on a specific technology with a
22 regulatory strategy like the EV mandate is a very
23 high risk strategy for government to pursue.

24 If the technology you choose doesn't
25 come through, not only have we spent a lot of time

1 and money trying to develop it to satisfy the
2 demand, it didn't sell and we wasted money that we
3 could have spent somewhere else.

4 It's probably more effective to set the
5 goalposts with regard to what air quality do we
6 need to achieve, and then move away and let the
7 industry that's being regulated figure out how to
8 do it.

9 We're not very successful at predicting
10 which technology's going to succeed, and I would
11 suggest that in the regulatory side it's likely
12 they'll be even less successful at picking the
13 single best technology. Don't make it too narrow
14 a room to play in.

15 One example of that that I can -- well,
16 let's see, you're about of DOE, right? Then --

17 (Laughter.)

18 MR. HERMANCE: Then I can use with some
19 affinity, because this is a California group in
20 general, the DOE clean cities program. It has
21 some good goals and stated goals of improved
22 energy efficiency, but at the time it was written,
23 it was written fairly narrowly around alternative
24 fuels.

25 I'm ready to bring to market a

1 technology which is 90 percent cleaner than a ULEV
2 from a criteria emissions standpoint, and 40 to 50
3 percent reduction in CO2 emissions, and it doesn't
4 qualify for the program because it consumes
5 gasoline. Somehow that seems to be a disconnect
6 with the overarching desire to make clean cities.

7 And one minor point to correct. Prius
8 development was actually driven not by the EV
9 mandate, but by a less than wholly enlightened
10 demand for fuel economy in other markets we serve.

11 The Japanese market pays \$3 to \$4 a
12 gallon for gasoline. Fuel efficiency in that
13 market is maybe number three on the reason for
14 purchase of a new vehicle.

15 Fuel efficiency on the U.S. buyers hit
16 parade for reasons to buy a new vehicle it's about
17 17th, the last time I saw it surveyed. Prius
18 wasn't developed in response to the EV mandate.
19 It was developed for fuel efficiency needs, which
20 was then broadened to be reductions in CO2 and
21 brought to the rest of the world from Japan.

22 And another point that has just been
23 made, we got to make sure we safeguard air
24 quality, the smog precursors and the particulates,
25 at the same time we attempt to improve energy

1 efficiency, because they are not the same. They
2 are linked, but doing good for one may not
3 necessarily do good for the other.

4 MR. BEEBE: Thank you, Dave. I think
5 probably the person you buy gasoline from would
6 like to hear that you think it's important to have
7 high priced gas, even though he will be led
8 kicking and screaming to raise his prices.

9 MR. HERMANCE: Well, no, actually in
10 fact most of the high price of gasoline in other
11 markets doesn't go to the producer, --

12 MR. BEEBE: Really?

13 MR. HERMANCE: Yeah, it's all taxes.

14 MR. BEEBE: So, that should give you
15 some ideas, too, I would think.

16 (Laughter.)

17 MR. BEEBE: The question number one
18 seems to me to be the kind of a question that
19 government, or a government agency might ask
20 because they either have decided they want to do
21 something and they look for some other third-party
22 verification, as we've called it, to sort of help
23 them along. Or perhaps they really haven't
24 decided whether it's a problem or not.

25 And I don't know whether the State of

1 California has decided that climate change is an
2 important thing to California or not. I don't
3 know.

4 But this climate change thing, first of
5 all, although we hear from insurance companies,
6 and we hear from big business who are afraid
7 they're going to lose this asset or that asset, it
8 really has to do with social questions.

9 And so when society begins to tell
10 government what to do, government will listen. I
11 believe that. So I think that if government's
12 looking for a consensus position they probably
13 aren't going to find it in one industry or another
14 industry. And they're not going to generate it,
15 themselves. It's going to have to come from
16 people.

17 So, that's my two cents on that. I do
18 note that this was a good quote from Jim Cathcart
19 that sunlight is reliable because it's not subject
20 to state or federal appropriations.

21 So, when you think about incentives I
22 would suggest that if you're going to invent
23 incentives to find ways of getting people to
24 either think about how they produce greenhouse
25 gases or to actually reduce them, don't make them

1 a slave to the appropriations process, or it will
2 just be more of the polarization that's paralyzed
3 so much of energy policy to date.

4 I do think that incentives work, though.
5 I'm intrigued by the idea of building some sort of
6 trade. But trades definitely need incentive. You
7 either have to have caps, which nobody likes. And
8 I don't think -- I think that the State of
9 California doesn't know what kind of a cap to use
10 anyway, so I wouldn't suggest caps.

11 So how are you going to get an incentive
12 into this trading process. That's one of the
13 things that perhaps in the great minds here in the
14 audience we can begin to deal with.

15 And with that, let's just sort of go to
16 the floor, as they say, noting that Mike thinks
17 that no consensus is particularly important; he
18 thinks education's good; he thinks that by
19 participating in the process you'll learn a lot.
20 And he's got lots of examples. But I notice that
21 all of his examples were able to sell his product
22 more into the market. So, he's making money at
23 this, and that's good.

24 Dave doesn't want to have regulations,
25 particularly on those mileage things, even though

1 he notices that mileage is an important thing to
2 one of his most important products that just
3 brought here today.

4 And Don thinks that the creative minds
5 of California will probably come to the fore.

6 And me, I don't know, I'm ready to take
7 your questions. Anybody got any questions for the
8 panelists or at large? Don Aitken.

9 CHAIRMAN KEESE: I'll take the first
10 one, just so I can tell you that you're going to
11 have to take the microphone here. You're going to
12 have to come up here to ask the questions so we
13 get it recorded.

14 But I had, I guess I'll make an
15 observation first. Where's Jim? The State of
16 California will have a policy in this area. The
17 State of California will be doing something.

18 We had our scientific panel. We had
19 this panel. In January and February we will be
20 looking at actions, we will be looking at exactly
21 the questions we've asked you here.

22 And I'm glad to see that the word
23 incentivize eventually came up, because the roles
24 I've heard are validation. There could be a very
25 valuable role for the state in validating some of

1 the claims that are made privately.

2 In the whole area, the way I see it, the
3 business community represented here, the whole
4 community represented here is way ahead of other
5 California institutions. You're way ahead of the
6 Legislature. You're way ahead of administration.
7 You're way ahead of the environmental community as
8 a whole in this issue of facing CO2 and global
9 climate change.

10 That would lead me to think that as we
11 formulate our policy to make recommendations on,
12 which will probably come from the Governor direct
13 when its time does come, that we certainly look to
14 what you've been doing and what suggestions you
15 have that can assist what you've been doing.

16 So, a role for the state in validating,
17 I see as positive. A role in educating, that's
18 been a crux of what the Energy Commission has been
19 doing in many of its programs over the years. I
20 accept that.

21 The question comes if somebody says what
22 do you need to do to incentivize, or should you do
23 anything to incentivize. I tend, I guess, not to
24 think that we should impose something.

25 MR. McADAMS: I'll give you one right

1 off the top. Senator Chaffey's legislation, I
2 think, is very important legislation. And our
3 company's endorsed it, along with many other
4 environmental groups and other corporations.

5 Focusing on Kyoto is not necessarily a
6 requirement for the State of California. It falls
7 into another different political jurisdiction of
8 the United States Senate, which is an interesting
9 chamber these days.

10 But what the state needs and what the
11 United States Government and what governments
12 around the world need is they need the business
13 community, in conjunction with others, to create
14 these new processes and deliver tons. This is
15 about delivering tons now.

16 And a signal from the political
17 jurisdictions and authorities from where we
18 operate our facilities that those early movers,
19 those people that are willing to take the risk,
20 because there are -- I cannot tell you how many
21 soothsayers there are of what we have done in BP
22 in the industry. Why are you doing it. You guys
23 are going to -- we're going to beat you in the
24 marketplace because you're driving your cost base
25 up, et cetera, et cetera.

1 A simple resolution from the state, or
2 something that rewards early movers for the tons
3 we have, so we do not lose the credits for these
4 tons, is a nice incentive.

5 CHAIRMAN KEESE: You're not suggesting a
6 trading program, you're suggesting a system under
7 which -- we've got a database, a system under
8 which we could verify data.

9 MR. HERMANCE: At least on our side of
10 the business these advanced technologies, the
11 technology that's capable both of reducing
12 criteria emissions and reducing CO2 aren't cheap.

13 They are premium cost on the product.
14 I'm not suggesting that the state pays for them.
15 I don't want to go there. You couldn't afford it
16 on a long-term basis, anyway.

17 But some acknowledgement of the early
18 work we do. And as was mentioned in one of the
19 earlier presentations, clearly don't index what
20 we've got to do in the future off of the then-
21 current baseline and penalize those that move
22 early.

23 And some kind of a trading mechanism so
24 not all the manufacturers in any one industry are
25 able to move at the same pace. Decide what pace

1 that overall we need to move at, and then some
2 trading format is probably of some value to offset
3 the early costs.

4 Otherwise there's no incentive to bring
5 the technology early, because it's just cost
6 penalty.

7 CHAIRMAN KEESE: But you're suggesting
8 California might think of having --

9 MR. HERMANCE: No, I'm not sure that
10 that's possible at the state level.

11 CHAIRMAN KEESE: Thank you.

12 MR. BEEBE: Thank you, Chairman Keese.
13 Don.

14 DR. AITKEN: I'm Don Aitken, I'm Senior
15 Staff Scientist with the Union of Concerned
16 Scientists. I know many of you. I drove here
17 from Berkeley this morning in my EV1.

18 You gave us a fine presentation in our
19 office in Berkeley, and you loaned us your Prius.
20 And I can't wait for you to introduce that next
21 year.

22 There are two underlying debates really
23 going on here. The goal is to clean up the
24 environment, reduce energy use, increase
25 productivity. These are goals that we're after.

1 And one view of that is simply set those
2 standards. The environment will progressively be
3 cleaner, and then just turn everybody loose
4 collectively and say, meet it.

5 But I find myself wondering why the
6 refrigerator manufacturers would pay a whole lot
7 of attention to a standard that tries to clean up
8 the air shed, and therefore I find great value in
9 the appliance efficiency standards that we have.
10 And I found great value in building efficiency
11 standards that we have as enabling the overall
12 goal. And it doesn't make any sense to me to
13 leave vehicles out of that.

14 Or as we have it with buildings and
15 appliances and other things, then not -- and we
16 also have it with electric utilities actually,
17 coal-fired power plants having to clean up, lots
18 of things like that. Renewable portfolio
19 standards coming in. It doesn't make sense to
20 have the transportation or vehicles, I think, to
21 be left out of that.

22 And the debate really is that, is
23 whether we're just trying to set governmental
24 standards for improved environment or whether we
25 should continue to facilitate them technology by

1 technology. And the second half of that debate is
2 whether we facilitate it by government standards
3 or whether we facilitate it by incentives.

4 And I think we should continue on this
5 table to look at incentive versus standards.
6 Because whenever we can find incentives to do it,
7 it's great. If we can't find incentives to do it,
8 we still need to get it done.

9 So I'd like to see these developed as we
10 continue in this discussion.

11 MR. BEEBE: Discussion on that?
12 Counterpoint, or --

13 MR. HERMAN: Clearly from a standpoint
14 of exhaust emissions the regulators have set an
15 emission standard and we've met it.

16 As they get progressively more stringent
17 we've needed flexibility by having multiple
18 standard classes to meet a fleet average. And in
19 that regard where there is no perceived -- well,
20 at least historically there was little perceived
21 customer benefit to that, although we all
22 disagreed with that, we know that there was
23 significant societal benefit to it.

24 That seems to have been effective.
25 Where we've gone, I think, a bit astray is with

1 trying to pick a winning technology and force a
2 subset of the air quality requirement into a
3 specific technology instead of just setting what
4 the requirement ought to be and letting us figure
5 out how to get there.

6 Energy efficiency, CAFE, for some
7 reason, hasn't worked hardly at all. Maybe it was
8 the structure of the program, maybe it was the --
9 I guess I don't know what the reason is there, but
10 it's not clear --

11 MR. BEEBE: Pick-up trucks --

12 MR. HERMANCE: -- the CAFE --

13 MR. BEEBE: -- is my own --

14 MR. HEITZ: I guess I'm just jumping in
15 on a cross-panel discussion here, --

16 (Laughter.)

17 MR. HEITZ: -- so there's been no change
18 to it at all. The 13 years before that, it
19 doubled the fuel economy of the fleet. So at --
20 incredibly low cost.

21 Many view the CAFE standards as the
22 premiere environmental policy during the '80s in
23 the nation. And if you look at dollars per unit
24 pollution avoided, it's down with anything.

25 So, you're right, it hasn't worked since

1 1985.

2 MR. BEEBE: Yeah, just a short retort.

3 MR. BURNETT: A really short retort to
4 this, too, is in Japan your sales are being driven
5 by the fact that energy is high cost. Here it's
6 17th. So you're not going to sell any Priuses in
7 this state on the fact that it's low cost fuel
8 consumption.

9 It is, in fact, the air mandates, the
10 various mandates that we have that are going to
11 provide you the opportunity to make sales of your
12 vehicle in this state.

13 MR. HERMANCE: Well, you're right, we're
14 not going to sell Prius on the basis of fuel
15 economy, not to this market. But we have to sell
16 it on the basis of other attributes therefore.

17 We will no doubt advertise that it's
18 clean. We will no doubt advertise that it gets
19 good fuel economy. But the advertising program to
20 sell that vehicle will be challenging and far more
21 comprehensive than just clean emissions and good
22 fuel economy.

23 MR. BEEBE: We've got to use these kinds
24 of mikes. Must use these kinds of microphones.

25 MR. HEITZ: It strikes me that this is a

1 very interesting chance to take the challenge that
2 was laid before us by the Chairman and apply it to
3 the Toyota situation.

4 Is there an incentive, forget what
5 regulation got us there. You've got a beautiful
6 product, environmentalists are going to love it,
7 it performs well, and so on.

8 Is there anything the state could do now
9 that would offer incentives into the market that
10 would help you? And that's -- I would toss that
11 question out.

12 MR. BEEBE: Yeah, that the state could
13 afford, also. Yes, sir.

14 MR. BURNETT: Often it's difficult to
15 get new standards set at a preferred level, and
16 incentives can be a transitional approach, policy
17 approach towards getting enough market share for a
18 certain level of efficiency out in the
19 marketplace, then you can move forward and set a
20 standard.

21 Often if you set a standard that's --
22 want to set a standard that's very high you can't
23 get it done because it's a new technology, there's
24 a lot of opposition.

25 MR. BEEBE: You know, I was really

1 tickled by partnerships, and the thought that
2 United Technologies only produces some 2 million
3 tons a year of carbon dioxide, and yet they make
4 the machines that produce 400 million, you know,
5 for us. That's a very very interesting potential
6 partnership.

7 Perhaps the State of California ought to
8 be thinking about partnering people like Advanced
9 Materials with Intel, or with -- who uses a lot of
10 computers. You know, that kind of a partnership
11 may be the type of incentive, a forced partnership
12 might be the type of incentive that would work.

13 I guess incentives can be both carrots
14 and sticks.

15 Questions, more questions, we've got
16 about ten minutes left --

17 MR. McADAMS: Just one point I wanted to
18 make on the incentive piece which goes back --
19 which comes back to the customer demand piece.
20 When we introduced the low sulfur gasoline into
21 Atlanta, the number one thing that landed with the
22 customers was we made a promise that we wouldn't
23 raise the price of the gasoline.

24 And the incentives that the Governor
25 provided was the Governor came and helped us

1 announce our gasoline. That was a reputational
2 benefit.

3 We didn't know at the time, but the
4 State of Georgia has a lot of vehicles that they
5 use around the state. And so the Governor of
6 Georgia announced one of the things that the State
7 of Georgia can do is choose the gasoline it
8 chooses to burn. And from this point forward it
9 will burn the cleanest, low sulfur gasoline in
10 this area of the state. That's an incentive.

11 It's not a broad policy. But what I'm
12 trying to suggest is that somewhere between the
13 debate, the absolute black-and-white debate
14 between the standard works or it doesn't work, we
15 need to try to partner to find the new tools in
16 the toolbox that can help move this forward.

17 And ultimately the person that we need
18 to move forward through the education process and
19 this incentive process is the customer.

20 MR. BEEBE: This is not a walk-around
21 mike. Technology gets us again. Well, maybe
22 technology will get us out of this, and maybe
23 society will get us out of this.

24 Do we have any thoughts here on
25 potential partnerships, or the way you would like

1 to see incentives run? Here's a question for you:
2 We have transportation up here and we have
3 electricity up here.

4 Both of them are large pieces of the
5 greenhouse gas production in California, although
6 they have slightly different ways of affecting
7 society.

8 Do you think we ought to concentrate on
9 one part or the other? I mean there's a real
10 flame in your eyes when you're talking cars. But
11 you didn't -- you're laid back on the electric
12 utility stuff. I'm a little surprised.

13 (Laughter.)

14 MR. BEEBE: Hey, how are you going to
15 feel when it's time to shut down Diablo Canyon,
16 and you find out that that sucker's worth, I don't
17 have the right number, but I know it's a very
18 large, large number in terms of if we make that
19 same amount of electricity with a natural-gas-
20 fired cogen, how are you going to feel about that?
21 What is your response? What do you want to do now
22 about that situation that will make that choice
23 easier when the time comes to either shut it down,
24 or prolong its life, or make a new one right next
25 door to it?

1 That natural gas thing, huh? Hey,
2 hydro's about the same way.

3 MR. HINKLE: Yeah, I have one comment
4 here, and I don't even know if I could represent
5 my company in saying this, so I'm going to couch
6 it very carefully.

7 MR. BEEBE: You're among friends.

8 (Laughter.)

9 MR. HINKLE: You know, we talk about
10 incentives, and we talk about partnerships, and
11 clearly this is a fairly early adopter situation
12 so you obviously are going to have to create a lot
13 of partnerships and relationships.

14 But, you know, there's a fundamental
15 question here. How did we get where we're at
16 right now? And it's because we have an economy
17 that doesn't full cost everything.

18 So if you really want to fix the problem
19 you start getting full charging for what the real
20 actual cost of energy is, or the actual cost of
21 putting stuff in a landfill, or the actual cost of
22 all this stuff.

23 And if you really actually fully cost
24 it, and to make sure that money goes back to
25 mitigating that, the problem goes away.

1 So, if there's an active role that
2 government can take place, is they can figure out
3 how to move the economy towards a more I guess
4 environmentally friendly perspective.

5 And if you want to take the car example,
6 for instance, I'm not talking about taxes, but for
7 instance if you were going to provide an
8 incentive, why does everybody who buys a car pay
9 any kind of taxes at all on that car if they're
10 buying a low emission car? Make it tax free.

11 And then re-collect that money be
12 increasing the taxes of people who buy the high
13 emitting cars.

14 MR. BEEBE: So a graduated scale based
15 on emissions kind of a thing?

16 MR. HINKLE: Environmental impact.

17 MR. ROSENFELD: Yeah, I just want to
18 say --

19 MR. HINKLE: Well, I know politically
20 it's not very possible, but I'm just saying --

21 MR. ROSENFELD: No, actually I wanted to
22 tell you it's not -- fee-bates, which is what
23 we're really talking about, it's not only
24 possible, I just want to remind you folks that
25 about ten years ago the idea of fee-bates for cars

1 was much discussed.

2 I'm trying to think it was passed the
3 Senate with no opposing votes; it passed the House
4 with only seven opposing votes. It was vetoed by
5 a very conservative Governor Deukmejian who called
6 it dangerous social engineering, which I guess it
7 is.

8 But it's not off the table at all. And
9 one other comment about that. And that is in
10 those days there weren't any beautiful things like
11 Prius and other companies on the horizon. So the
12 thought on the fee-bate at the time was that you
13 had a fee base on environmental externalities. It
14 wasn't just CO2 it was CO2 plus NOx plus SOx and
15 so on.

16 So there also weren't any sports utility
17 vehicles, but I mean the modern version of it
18 would be that the sports utility vehicle pays
19 several thousand dollars into the pool, and this
20 very same day it's paid back to the benign
21 vehicles.

22 The only wrinkle to that, I would say,
23 makes it more modern is if you want to keep the
24 volume fairly small, you also add a fact that new
25 cars or new vehicles with a very low market share,

1 a 1 or 2 percent, you could afford to give a very
2 large rebate to because it wouldn't cost society
3 anything.

4 And that could tail off as market share
5 gets up to the 5 or 10 percent where you can think
6 about standards and so on.

7 So there are lots of marvelous
8 politically acceptable and interesting things you
9 can do with fee-bates.

10 MR. BEEBE: And, yeah, Heitz.

11 MR. HEITZ: Just to add a few more
12 pieces to that, worthy of consideration, I mean
13 why not have these hybrid vehicles free in carpool
14 lanes, for one thing? Why not have free tolls?
15 Why not have parking that designates particular
16 areas for hybrid vehicles, or any vehicle that
17 meets a certain standard, where you just make that
18 easy to do.

19 And also --

20 MR. ROSENFELD: And show off your car.

21 MR. HEITZ: And you show off your car.
22 I mean, and then those things should have natural
23 exits to them when a certain percentage of the
24 fleet is there, then it should no longer be a
25 benefit.

1 But for the early adopters, just as
2 early adopter businesses should be rewarded. And
3 this is something you'll find that the
4 environmental community is very much behind. We
5 would like to help the early innovators get
6 rewarded.

7 And so you'll have backing for those
8 sorts of things, whether it's in the California
9 Legislature or some other. So we would encourage
10 those.

11 MR. BEEBE: Are there additional
12 questions or perspectives? We've got several
13 minutes left in this session.

14 MR. MAZOR: Hi, I'm Steve Mazor from the
15 Auto Club. I'm going to change the subject just a
16 little bit.

17 We keep talking about cars, we're
18 talking about new cars. We have a tremendous
19 fleet of cars already on the road that are at a
20 certain level of fuel economy, and I'll draw a
21 parallel, the California Air Resources Board, by
22 direction of the State Legislature, has now got to
23 study the cost effectiveness of accrediting
24 vehicle update parts for emission purposes, parts
25 that will improve the emissions performance of

1 existing cars.

2 How about a parallel accreditation
3 program by the Energy Commission to certify
4 products that will improve the fuel economy of the
5 existing cars? Because as we're talking about new
6 cars rolling out and zero emission vehicle
7 mandates, electric cars that people maybe won't
8 buy, those aren't going to have a big impact short
9 term.

10 Perhaps improving the performance of
11 cars that are on the road now with the backing of
12 the State of California and the reputation of the
13 State of California that says, this product will
14 improve your fuel economy by this amount, and then
15 perhaps the state assisting motorists to update
16 their cars might help the problem more in the
17 short term.

18 MR. BEEBE: That's a consumer-oriented
19 item, thanks, Steve.

20 We got other interests and comments out
21 there? If not, maybe what we'll do is we'll bring
22 this one to close and we'll go on to the next
23 panel.

24 Thank you very much.

25 (Applause.)

1 MS. DELLER: Thank you, Bud. Thank you.
2 Our next panel is manufacturing,
3 telecommunications and agriculture, which Patrick
4 Healy is going to be moderating. And I understand
5 he's going to give everybody on his panel a case
6 of wine for every comment they make.

7 (Laughter.)

8 MR. HEALY: We don't need to provide a
9 lot of incentive to drink wine, I guess, --

10 (Laughter.)

11 MR. HEALY: -- if I brought product I'm
12 sure you'd all wouldn't mind sampling.

13 We've got the two questions here. Clay
14 Hinkle, Ravi Kuchibhotla, and Wendy Cook -- you're
15 replacing Wendy Cook, okay, and Jim Callaghan and
16 Judy Pike and Judith Bayer and Rick Plavidal --

17 MR. SCHOENING: No, Jerry Schoening.

18 MR. HEALY: -- Jerry Schoening, okay,
19 got the wrong name, sorry.

20 MR. SCHOENING: A substitution.

21 MR. HEALY: Okay, Jerry. So, Jerry,
22 would you like to start off with -- I think we can
23 kind of take these two questions and lump them
24 together and they address some of the same issues,
25 so would you like to come up here -- or have you

1 got the mike? Okay.

2 MR. SCHOENING: Well, the first one,
3 regarding a consensus, I'd just like to talk a
4 little bit first about an achievement. The
5 semiconductor industry has reached a consensus
6 worldwide. There is a world semiconductor
7 council, and this council represents the industry
8 worldwide.

9 And as an industry we have committed to
10 exceed the requirements that were required by
11 Kyoto for PFC emissions reduction.

12 So, how did that happen? Several years
13 ago the industry engaged in a discussion with EPA,
14 and it principally happened between the
15 semiconductor industry association, the supplier
16 community that I'm a part of in this equation, and
17 the EPA, to decide how would we address this as an
18 industry.

19 It was the industry's preference that
20 this should be a voluntary reduction program with
21 each company individually committing to what they
22 thought they could do. And each company being
23 free to decide what technologies that they were
24 going to employ to meet these goals.

25 And so going down that path, the EPA

1 brokered some agreements with each of the
2 semiconductor manufacturers like Intel, IBM,
3 Motorola, et cetera, worldwide, to arrive at these
4 voluntary goals.

5 And they were done on paper, signed by
6 company CEOs and so forth. But it was an
7 agreement between the EPA and the company, and it
8 was not all to a certain level. It was between
9 these two parties. Self-governing, self-
10 reporting, and industry flexibility.

11 And what this has resulted in is this
12 worldwide commitment to exceed the goals. And we
13 know that we're going to do it.

14 So I think there's a great opportunity
15 for any industry to do that kind of thing, working
16 with government agencies, if the parties are
17 willing to engage in that discussion.

18 It was not necessarily a really easy
19 thing to do. There was a lot of raised voices and
20 pounding on tables and things of that nature. But
21 eventually we came to that.

22 And what I believe that really did was
23 to establish a trust relationship between the
24 regulators and the industry. And that has helped
25 along the way.

1 Another thing, the second question, what
2 could the state do to assist companies to reduce
3 greenhouse gas emissions. I think it's a great
4 opportunity to somehow incentivize, maybe through
5 tax incentives, companies to spend money on R&D.
6 To invent new technologies. And that can be done
7 through a tax incentive of some kind.

8 With that, I think companies will be
9 more willing to spend the money and look for new
10 technologies which they, themselves, certainly
11 possess the capability to do.

12 That's my key points, thanks.

13 MR. HEALY: So, on the first point you
14 were speaking about, it seems that it was pretty
15 important to you that it be voluntary, this
16 collaboration with the EPA. And I think a lot of
17 businesses look at it in that sort of manner, that
18 they want to take steps to do the right thing, but
19 they don't want to be mandated to do that sort of
20 thing. They want to take those steps forward in
21 conjunction with government agencies, perhaps.
22 But not to have the strong arm over them.

23 Is that --

24 MR. SCHOENING: That's correct.

25 MR. HEALY: -- a correct assessment on

1 that.

2 Judith, would you like to speak to these
3 questions?

4 MS. BAYER: I guess my comments will be
5 first I view these two questions, the first one as
6 a process question, and the second as a substitute
7 question.

8 The process question is how do you build
9 consensus. And I guess I would offer that
10 consensus to me is probably a pretty daunting
11 challenge considering where we are. And therefore
12 I would suggest an intermediary step along the
13 lines of some of the discussion here and that is
14 to first build partnerships.

15 Partnerships, I think, are a very
16 effective way of ultimately building consensus.
17 But to jump from ground zero to consensus, I
18 think, is a pretty daunting challenge. And even
19 under the best of circumstances, proves difficult.

20 And when I look at the consensus type
21 activities that I've been involved with
22 personally, the ones that have been effective from
23 a process standpoint are those that have
24 essentially started from the center and those that
25 have started with common ground.

1 And I think in looking at an ultimate
2 goal of building consensus, intermediary goal of
3 building partnerships, you look for those natural
4 alliances. You look for the common ground and the
5 commonality between the business community, the
6 environmental community, state and local
7 governments and the regulatory community. And
8 what are those commonalities.

9 And I think that's really the first
10 test. What do we have a vested common interest in
11 that we can pursue together through a partnership
12 type arrangement.

13 I think education is critical here.
14 I'll share with you an anecdote from our UTC
15 experience where we had a program to improve the
16 energy efficiency of one of our plants in Florida
17 that was dedicated to getting people to turn their
18 computers off at night. Sounds very
19 commonsensical, sounds pretty basic as far as
20 housekeeping.

21 But our information systems folks have
22 been very effective over the past ten years in
23 educating people to leave their computers on. We
24 had a 99 percent compliance rate when we did our
25 baseline to the IS dictate that said keep them on

1 because our technology was such that the IS people
2 couldn't do any of their updates if the computers
3 were turned off.

4 And so we had to go in with an education
5 and awareness program first with our information
6 systems folks, to educate them to the fact that
7 our engineers in Florida that were designing
8 aircraft engines could, in fact, make a
9 distinction between turning off their monitor and
10 turning off their computer.

11 And secondly to educate them on state of
12 the art computers that do have energy saving
13 devices and it doesn't wear and tear the computer
14 to turn it off once a day 365 days a year.

15 That education and awareness program,
16 and the purchase of decals cost \$4000. We saved
17 last year \$230,000 by simply turning off 5000
18 computers.

19 So education is a very powerful tool. A
20 lot of this is common sense. That brings me back
21 to the consensus issue which for me has sense in
22 the middle of it, sense meaning dollars and cents,
23 and sense also meaning common sense.

24 The second question which is a
25 substantive question, again coming from my

1 background, my husband is a doctor, first do no
2 harm would be my advice to you when you're looking
3 how to engage the business community.

4 And I think there the message is for
5 companies like ours and companies around this
6 table that are making investments in energy
7 efficiency, we need to know that legally we will
8 have recognition for having made those
9 investments.

10 Those investments make sense today
11 because the assumption, naive or otherwise, by the
12 part of our CFOs as well as our CEOs, that that
13 activity will, in fact, be sanctioned by the
14 regulatory regime that someday will be in place.

15 And so baseline protection, legal
16 recognition of what we've done today is an
17 absolutely critical element in first removing a
18 potential disincentive. I would argue you can't
19 get to the incentive side of the equation until
20 you remove the disincentives.

21 And I can't tell you how many of my
22 business colleagues I talk to that say, what the
23 heck are you investing in this now without any
24 legal recognition for what you are doing and what
25 you're accomplishing.

1 And so I think that's a very important
2 thing that a lot of people skip over and go
3 directly to how can we provide incentives.

4 First, do no harm. First, give legal
5 recognition to what companies are doing. And then
6 we can start to talk about the incentive side of
7 the equation.

8 From my company's perspective in the
9 building arena, for example, tax credits for
10 energy efficient buildings, building codes are
11 very very critical. We think they're a very
12 important stimulus. We think they're a very
13 important part of the equation.

14 We would point to legislation in New
15 York State, as well as some legislation that's
16 been introduced here in California, as being a
17 very positive sign in looking at what sorts of
18 incentives from a tax credit standpoint can, in
19 fact, provide the opportunity for our customers.

20 And, again, this goes back to an earlier
21 discussion where it's the customer relationship
22 here, understanding who your customer is, and what
23 motivates them to make these sorts of decisions.

24 And so I think that when we look at the
25 arsenal of tools that are available to provide

1 incentives, to provide motivation, to provide
2 encouragement to companies, we shouldn't be so
3 rigid as to think one size fits all, or one weapon
4 in our arsenal is going to supply all the answers.

5 If the only tool you have is a hammer,
6 everything looks like a nail. And I would suggest
7 that we need to industry sectors, we need to look
8 at companies in particular, and ask them what
9 sorts of incentives are important to you.

10 We've experienced this, quite frankly,
11 with the federal government that rolled out a
12 climate change technology initiative, and on the
13 first go-round never asked industry, well, what
14 would help you.

15 And it was poorly targeted. They
16 provided R&D credits to folks who wanted tax
17 credits. And they provided tax credits for those
18 who wanted R&D money.

19 So as part of this dialogue with the
20 business community ask the business community what
21 sorts of incentives are important to you, and are
22 important to your customers. And I think you'll
23 have a much better design and a much more
24 effective program.

25 MR. HEALY: Judith, I noticed you used

1 the word education, but didn't really tie it into
2 what the California Energy Commission or other
3 agencies might be able to do to further that
4 education. Maybe that's something we can all
5 think about.

6 And also perhaps highlighting companies
7 such as BP Amoco and Toyota that are doing good
8 things. And showcasing them. And maybe using
9 some of their data to impress the other part of
10 the business communities.

11 Okay, Judy Pike.

12 MS. PIKE: I don't have an awful lot
13 more to offer, but one of the comments that I
14 picked up on that someone made was the State of
15 California has not decided that the green programs
16 are important.

17 Well, I think if the State of California
18 hasn't decided that, it's even more apparent that
19 business hasn't decided that.

20 An awful lot of times we hear our
21 competitors in other companies saying that's
22 nothing more than a marketing tool, and then you
23 have to go through all the explanation of why it's
24 more than a marketing tool.

25 And I don't think a lot of businesses

1 really see that there are advantages. So I would
2 say again, using the same word validation, that
3 green policies and partnerships are profitable,
4 they're the right thing to do, and that we do have
5 customers that are demanding it, but they're not
6 demanding it at a huge rate at this point.

7 So, then just continuing along those
8 same lines is education. I would like to see some
9 sort of standards come in from the state for the
10 school systems, as well as some kind of road maps
11 to help companies who don't even know where to
12 start. Where do we begin to start doing the right
13 thing.

14 They're depending on others of us in
15 perhaps the same industry or related industries,
16 and we don't necessarily have all of those answers
17 for anyone else's business. But I think we could
18 develop some of those roadmaps and help someone
19 get started.

20 I'm a little bit concerned about the
21 graduated, as I interpret it anyway, graduated
22 standards while we wait for volunteerism. I think
23 if we wait for people to do, or companies, or
24 perhaps even governments, to do the right thing,
25 that there's not going to be anything left here

1 for us to do the right thing for. That our world
2 will disintegrate underneath our feet.

3 I think we have to be proactive. And I
4 don't think we're being proactive right now.

5 I would support, I hope I'm speaking for
6 my company now, I would support both incentives
7 and some standards. I'd like to see both,
8 frankly.

9 I think the early developers, we need
10 some help and some reason to spend more money.
11 And what comes to my mind right now are the NOx
12 credits now, that we can buy if we don't meet our
13 AQMD standards. And so you pay a little bit extra
14 more money. It doesn't cost you anything. It
15 doesn't mean you're doing the right thing. You're
16 just paying a little bit more money to buy those
17 credits, instead of improving our processes to the
18 point where we would pass all of those standards.

19 So, I think that's about it.

20 MR. HEALY: If there's anyone out there
21 that wants to make a comment as we go along here,
22 feel free to raise your hand and you can address
23 the speaker after they speak. Anyone want to
24 speak up at this point? Yes. Come on up.

25 MS. WOOD: My name's Lisa Wood, I'm a

1 Climatewise coordinator for San Diego. There's
2 been a lot of talk about education, so I thought
3 I'd weigh in on that.

4 My opinion is it's more than developing
5 a curriculum. I think you've talked about
6 recognition of your programs, some of you that
7 have been doing the right thing. Recognition of
8 your programs is education because then you get a
9 chance to talk about what worked. You get a
10 chance to talk about turning off those computers.

11 I also think funding programs,
12 particularly programs that are a little bit on the
13 edge, like alternative vehicles, also
14 photovoltaics are still a little bit on the edge
15 now, particularly because of the economics of it.

16 So funding model programs, and then
17 highlighting those and spotlighting those, I
18 think, is a really effective way to do the
19 education that we're talking about.

20 Curriculum development, there's a lot of
21 that going on, and in fact, as I go through the
22 grant opportunities there's quite a bit of grant
23 money for it, but I think actually accomplishing
24 programs might be part of that educational
25 component. I don't know if other people have an

1 opinion.

2 MR. HEALY: Good point. Did you want to
3 respond to that, Judy?

4 MS. PIKE: No, I think that is an
5 excellent point. There is curriculum out there.
6 I'm not sure that everybody's utilizing it. I
7 don't know how we get the point across that it
8 does need to be utilized.

9 The kids, in dealing with the young
10 people that I deal with, they're sponges. They
11 love this. They buy into it a hundred percent.
12 They have trouble with their teachers following
13 through with some of the things they talk to them
14 about.

15 MR. HEALY: Okay. I guess we'll go on
16 here to Jim Callaghan.

17 MR. CALLAGHAN: Okay, thank you. Well,
18 as I indicated in my presentation earlier today,
19 this isn't necessarily my total field of
20 expertise, but today for me and for our company,
21 has been a very enlightening day. The different
22 programs that are out there and available, and to
23 hear the other companies and what they're doing
24 for climatewise programs.

25 I think my main focus would be is that a

1 company of our size of about 10,000 employees, \$3
2 billion in revenues, there's a number of companies
3 in California that probably don't even know that
4 all these programs exist. And that all this is
5 being done by the different commissions and the
6 larger corporations around here.

7 So I'd like to stress today, in essence
8 question number two, is the education aspect of
9 it. Getting to those smaller businesses and
10 getting them on the bandwagon for climatewise
11 programs.

12 I think we're, at least in San Diego and
13 southern California we're missing a lot of those
14 interim and medium-sized businesses that don't
15 know of all the efforts being applied, such as the
16 other businesses that are involved, larger
17 corporations.

18 And, again, raising the public awareness
19 is a key factor, such as I learned today about,
20 you know, Bentley Mills going out to the high
21 schools and stuff, and programs. I think that's
22 really good, but you don't hear much about that in
23 the media, and you don't hear about the companies
24 and the recognition of those companies, and the
25 efforts that they have put forward.

1 The things I've learned today from BP
2 Amoco and Toyota, you know, I had no idea those
3 types of programs are going on. So I think that
4 communication is critical.

5 And then again, the incentive programs
6 for us and our company, and our company size, have
7 been really tremendous for us, to jump into the
8 different types of programs and to learn about
9 those programs.

10 So that's about it today from my
11 standpoint.

12 MR. HEALY: And just to sidetrack a
13 little bit, BP Amoco has a real uphill battle in
14 their struggle there, because everyone will look
15 at them and say, oh, yeah, sure, they're doing the
16 right thing. But what are they making? Gasoline.

17 Well, somebody's got to make gasoline.

18 MR. McADAMS: I can assure you they're
19 monitoring our progress.

20 MR. HEALY: Yes. And with a company
21 like Fetzer Vineyards, marketing does not see our
22 environmental stance as a tool for marketing.
23 We're doing this because we feel like it's the
24 right thing to do.

25 Ravi, do you want to speak to IBM's

1 stance on this, or your personal stance?

2 MR. KUCHIBHOTLA: Yes. I'm not a policy
3 person, but I'm an engineer like Dave is, from
4 Toyota.

5 I agree with Jerry's comments before.
6 Voluntary programs is the way to go from my
7 perspective, not mandatory kind of standards. So
8 once you set a standard, after you achieve the
9 standard, what next? Complacency kind of sets in
10 because of that and other reasons.

11 And not only that, voluntary programs
12 give you the flexibility, the creativity to come
13 up with new kind of basic inventing things and
14 whatever.

15 And also, the second point is the energy
16 efficiency, a lot of people talk about the
17 incentives. Our company has benefitted, saved a
18 lot of money in the cost of operations.

19 As I presented before, we saved about
20 \$518 million in the last ten years. That's a big
21 economic sense. Not only makes environmental
22 sense, but also big economic sense.

23 That message, I think, has to get to the
24 people. That's where I think part of the
25 education probably as Judy was saying, may be

1 passed on to the folks.

2 So, that's about it, the main things.
3 And coming to the question number two, I think the
4 California Energy Commission, policymakers, they
5 got to promote voluntary programs, as I said
6 before. And educate about the economic sense, and
7 also the energy efficiency, one more aspect of it
8 is, it's a low risk. There's almost no zero risk,
9 but high return. That's the whole thing. That
10 message also has to get there.

11 And one more thing, this is my personal
12 thing. We got to expand the definition of green
13 power to include the clean power. By renewable,
14 through renewable energy resources alone you
15 cannot meet with any Kyoto goals or whatever,
16 because it's -- well, the capacity of the
17 renewable energy resources is less than 1 percent
18 of this country's generation. So it's got to be
19 other, it should be coming from other power
20 plants.

21 Like Art said, that refrigerator
22 program, you can integrate the whole thing into
23 homes, and come up with a better energy efficient
24 designs or whatever. And probably include
25 everything, the pc's and the air conditioning

1 units in the homes, and the refrigerators. A
2 similar program you can come up with and watch,
3 track it over the years. How many more billions
4 of dollars we can save.

5 That's about it.

6 MR. HEALY: So, one thing struck me
7 about what you said, Ravi, was that you're
8 challenging yourselves within the company. You're
9 being competitive within your own structure to go
10 forward, to meet certain goals.

11 You see money reductions, you see
12 kilowatt reductions, you see energy improvements,
13 et cetera, but you spur yourself on within, than
14 from without.

15 And I think a lot of companies that are
16 doing things in this area are working in that same
17 sort of structure. They're pushing themselves
18 interiorly rather than seeing mandates from
19 outside.

20 Clay, do you want to speak?

21 MR. HINKLE: Yes, I want to not fully
22 take issue with what you said, but a) I think it
23 would be a terrible mistake at this point in time
24 to promote any kind of standard on greenhouse gas,
25 you know, mitigation. And here's the reason, I

1 would say, especially for manufacturing.

2 One, is what would the standard be as
3 far as what are we trying to achieve. Are we
4 trying to achieve this Kyoto accord? Are we
5 trying to achieve what would make us sustainable
6 within the state? As far as, what is it, we
7 haven't even got clear on what we're really trying
8 to achieve here.

9 Secondly, the most effective programs
10 are ones that let people figure out how to solve
11 the problem and set a goal.

12 And so I think the better way to go
13 about it is to figure out what the goal is, and
14 try these partnerships and try these voluntary
15 programs.

16 I'm intrigued by your semiconductor
17 program. I think that, taken sector by sector,
18 especially from a manufacturing point of view,
19 makes a lot of sense.

20 I think the minute you start writing
21 regulations and you start putting that kind of --
22 those kind of things in place, you're going to
23 create a political situation that will mean we
24 don't solve the problem.

25 Greenhouse gas is different than ambient

1 air quality because when we do better on the
2 ambient air quality our air gets better here. To
3 do better on greenhouse gas everyone has to do
4 better on greenhouse gas.

5 So, from the point of view it really
6 does have to now be an internally driven thing, a
7 company has to step up and say, we're going to be
8 good citizens, and agencies need to step up and
9 say, we're going to help you be good citizens, and
10 these are the resources you can have, these are
11 the things that we can do for you, these are the
12 ways we can help you.

13 And I think you'll have more people
14 working with you on that.

15 But if it isn't a marketing tool right
16 now, if it isn't really a marketing tool, I don't
17 believe it is right now, because basic population
18 really, while they hear this every day in the
19 news, they really don't believe that this has
20 anything to do with them.

21 And so if you really want change you
22 have to get to the public. And the public has to
23 believe that this is a fundamental issue. And I
24 don't believe they do yet. I really don't believe
25 they do.

1 I think they'll believe it when I see
2 them buying a whole bunch of these Toyotas, or
3 something like that. But I don't think that's --
4 we're still buying the SUVs. So we obviously
5 don't believe it yet.

6 And one final point. And this is
7 learning from how we've done the Clean Air Act.
8 And this is -- which, in my mind, has gotten us a
9 long ways, but has a lot of problems inherent in
10 it.

11 If you're going to create a standard
12 make sure that you focus the regulations on the
13 places where the problem's at, instead of where
14 it's easiest to regulate.

15 We many times get caught up in any kind
16 of regulatory framework we go after the low lying
17 fruit instead of where the real problem is,
18 because it's politically not really feasible to
19 do.

20 And that's probably the biggest single
21 reason not to bring in standards as such that
22 would be the traditional regulatory, you know,
23 traditional regulatory framework, is because the
24 low lying fruit is being grabbed by people
25 voluntarily.

1 To get the other stuff you're going to
2 have to go after some pretty politically big cats.
3 And that's really increasing the price of what it
4 costs to -- increasing the price to reflect what
5 it really costs to use energy, what it really
6 costs to dispose of waste. And what it really
7 costs to use water. All those things that nobody
8 wants to pay for.

9 So, that's pretty much it.

10 MR. HEALY: Don, I would back you up on
11 the amount of wealth of information that's out
12 there from NGAs and governmental agencies that you
13 can work with, that will help you document,
14 expand, learn, do research for you.

15 Climatewise with the EPA has been a
16 really good program for us. World Resources
17 Institute has helped us out a lot. There are a
18 lot of places out there you can go to get
19 information. And people that are working
20 diligently in those areas.

21 But I also would agree with you that the
22 general public is, while they may on a
23 questionnaire say, they're an environmentalist,
24 they don't have a closed loop of what
25 environmentalist means.

1 And as far as from Fetzer Vineyard's
2 standpoint, we want to support things like green
3 power renewable energy. We think it's one of the
4 easiest ways the company -- we're under \$200
5 million company -- can make a statement about
6 reducing greenhouse gas emissions.

7 There's a little hurt dollarwise, but it
8 can help, you can spur energy efficiencies within
9 your company.

10 So, anything that the California Energy
11 Commission can do to help stimulate new renewable
12 power, and more moneys going to new renewable
13 power, I think new wind turbines, et cetera.
14 Obviously the whole state, if they went green,
15 wouldn't be able to be supplied with energy at
16 this point. So we've got to increase that.

17 We also, alternative energies, we would
18 like to continue to support solar. And at this
19 point there needs to be some grant money available
20 because solar doesn't hit the bottomline for most
21 companies.

22 And some sort of, perhaps some sort of
23 standard reporting form. There are a lot of
24 reporting forms out there, and they all seem to
25 have slightly different figures you can use,

1 little bits of dispute out there.

2 I think if there was a standardized
3 reporting form to be able to record your CO2, et
4 cetera, emissions, that might be helpful.

5 Are there any questions out there
6 anybody would like to speak about?

7 MR. BEEBE: Just an observation. You
8 bring up that it costs a little bit more to buy
9 green energy. Interestingly, in Sacramento you
10 can buy 100 percent renewable energy product,
11 electricity, for about a 12 percent increase on
12 your bill.

13 And people think about that. It's a
14 couple of hamburgers a month, it depends on
15 something. And yet if somebody moves from one
16 side of the Sacramento River to the other, they
17 change their bill by about 30 percent. And they
18 never think about it.

19 Because they really think of buying
20 electricity more as a tax than a purchasing
21 decision. And one of my biggest education things
22 at SMUD is to get people to begin to understand
23 that when they use energy they're making a buy
24 decision. And the buy decision says a lot of
25 things about where their money's going to go.

1 They don't always pay the absolute least
2 dollar amount for the shoes they wear, the clothes
3 that they put on their back, the car that they
4 drive, or any of those other things.

5 So, electricity, when people begin to
6 look at it more as something really purchased, the
7 5 or 10 or 20 percent more that it might cost for
8 truly sustainable renewable energy sources is, I
9 think for most people, probably worth it.

10 MR. HEALY: It's a quality issue.

11 MR. BEEBE: Yeah.

12 MR. HEALY: Yes, Art.

13 MR. ROSENFELD: The issue came up at the
14 beginning of this panel about tax credits, maybe,
15 I think it was you who mentioned them.

16 And this doesn't apply as much to the
17 state, I've been thinking about this for the
18 federal application, but I think I'll still make
19 the remark.

20 When you think about tax credits at
21 first you tend to think about things like
22 residential tax credits. Homes don't pay business
23 taxes, and so a tax credit, more or less, is just
24 money out of the treasury.

25 On the other hand, let's take a typical

1 business decision where you invest a dollar. The
2 benefit -- a decent business decision like this
3 always has a three-to-one benefit/cost ratio,
4 otherwise you're not likely to be very interested
5 in it.

6 And so you spend a dollar. You end up
7 saving \$3 by the time the ten-year shelf life is
8 over, or something, service life is over. On that
9 \$3 you're going to pay, between state and federal,
10 something like \$1.50 back to the treasuries.

11 So, the treasuries are making money
12 which they don't seem to have caught onto this,
13 but they are, in fact, making a lot of money off
14 tax credits if they just are sensible incentives.

15 Now, maybe in the spirit of today you
16 don't want to call them tax credits, maybe you
17 want to call them advanced credits on carbon
18 saving. That would be just a change in wording,
19 the arithmetic is unchanged.

20 So, we could afford to give significant
21 incentives in the form of tax credits, and just
22 make money. And I would like some of you folks to
23 put that in your arithmetic.

24 One other remark about tax credits. I
25 haven't -- this paper's like five years old, but

1 when it comes to residential tax credits, there
2 it's money out of the treasury, but there was an
3 interesting paper by a professor of economics by
4 the name of Ken Treene at Berkeley who showed that
5 tax credits have a big multiplier.

6 The very fact that the Energy Commission
7 or whatever has bothered to say this object is in
8 the best 5 percent, it deserves a tax credit, is a
9 significant announcement. And a large number of
10 people, this is based on real utility programs
11 analysis, a lot of people will then go ahead and
12 buy that quite independent of the size of the tax
13 credit.

14 So a fairly small announcement effect is
15 very large in terms of its application. I mean
16 ten times larger than what you read about market
17 elasticities in text books on economics.

18 So that's another reason for tax
19 credits, which you guys might want to consider.
20 Thank you.

21 MS. BAYER: Could I comment on an
22 element of Art's statement here, and I think
23 another part of the arithmetic is looking at the
24 life cycle costs and the payback periods that are
25 involved here to make sure that they are longer

1 term view, and are looking at the full costs of
2 some of these technologies.

3 And our fuel cells would be a perfect
4 example of that. To that point I would echo what
5 Ravi said earlier, and that is that we need to
6 expand our definition of renewable energy.

7 Fuel cells, for example, get that
8 benefit in states that have defined renewable
9 energy where we're using them, for example, in
10 landfills where we capture the methane and
11 therefore it's a closed loop system, so to speak.

12 But they don't get any advantage in
13 states where they're using a very strict
14 definition of renewable energy which speaks only
15 to solar, wind, et cetera.

16 And so I think our definition of
17 renewable energy, and our definition of what
18 qualifies for a quote, clean energy source, needs
19 to be expanded to embrace some of these other
20 technologies that clearly have environmental
21 benefits. They may not be, you know, 100 percent
22 of the renewable energy type definition, but there
23 are other worthy technologies there that ought to
24 be eligible for this kind of an incentive.

25 CHAIRMAN KEESE: I sensed a theme here

1 when I heard some people saying set standards,
2 some people say don't set standards. And yet the
3 theme that I thought I heard was that either
4 through voluntary activities or through
5 partnerships, somebody should be able to validate
6 the amount of emissions that are being produced
7 today.

8 And the assumption then is so that we
9 know where we've gone from, where we went today.
10 I almost thought I heard five people in a row say
11 something like that, whether they said they were
12 for standards or against standards.

13 Don't set a standard, but help us
14 validate what we're doing today, and then we'll
15 try to do better. Is that --

16 MR. ROSENFELD: I think baseline was a
17 very popular --

18 CHAIRMAN KEESE: Baseline, is that it?
19 That somebody needs to do a baseline?

20 MS. PIKE: Yes, I was thinking along the
21 same line. Baseline. You need --

22 CHAIRMAN KEESE: Somebody needs to
23 validate a baseline? Is that what you're saying?

24 MS. PIKE: Yes. Where we are right now
25 we have to have a goal, and if we don't have

1 some --

2 CHAIRMAN KEESE: So, you don't want us
3 to set the goal?

4 MS. PIKE: Oh, I don't care who sets the
5 goal, I just want the goal to be out there and
6 that's what everyone's trying to achieve.

7 CHAIRMAN KEESE: Voluntarily, after
8 somebody --

9 MS. PIKE: If we could convince all of
10 business --

11 CHAIRMAN KEESE: -- after somebody --

12 MS. PIKE: -- to volunteer to do that,
13 yes, that'd be great.

14 CHAIRMAN KEESE: -- validates the
15 baseline?

16 MS. PIKE: Right. I think that's the
17 issue, that enough of business doesn't think that
18 it's important to --

19 MR. KUCHIBHOTLA: Also the reason is,
20 one of the reasons is that there is no standard
21 yet how to verify this CO2, that's being developed
22 right along with, I think, WRI and the Center and
23 a lot --

24 CHAIRMAN KEESE: BP --

25 MR. KUCHIBHOTLA: -- yes. And also

1 there are centers like Art Rosenfeld's Center,
2 they are part of, they are voluntary partnerships
3 that may be coming along in the future.

4 And as part of the agreement on that,
5 voluntary agreement is a third party will verify
6 our CO2 emissions, should IBM choose to join that
7 program.

8 Those kind of things are coming up.
9 Johnson & Johnson is a climate savers program
10 partner. So their emissions are getting verified
11 by the Center.

12 So there are things like that are coming
13 up.

14 CHAIRMAN KEESE: So should the State of
15 California consider partnering with an entity like
16 that versus IBM partnering with one of these --

17 MR. KUCHIBHOTLA: Yeah, that may be a
18 good solution to that. Because the voluntary kind
19 of, instead of mandatory.

20 MR. McADAMS: I mean some people will
21 say you're a big company, you can afford to do all
22 this work to figure out what your emissions are.

23 So our response to that is we'll show
24 you how we did it. You will? It's not
25 proprietary, It's a new world. The internet's

1 there. Dial into our internet site. Pick up our
2 modeling, call our modeling people. Call Dames &
3 Moore, whoever we've contracted as a third party
4 to develop the models, to run the emissions
5 numbers.

6 Maybe that's one of the things the State
7 of California could do, is provide the energy
8 consulting service. You do now through the
9 utilities. You provide home energy audits. Maybe
10 you could provide a small business service of how
11 you do your baselines, you know, with a badge, a
12 verifier badge.

13 MR. BEEBE: An interesting convergence
14 of both competition and standards is there's a
15 good example of that when the GSA got together
16 with the EPA, and the utilities in California, to
17 develop a process whereby the federal government
18 could buy the absolute least-cost, 100 percent
19 renewable energy electricity they could.

20 That was an interesting process. And
21 what they wound up with was a good competition,
22 with several different companies bidding on a
23 standard product that was a 100 percent renewable
24 resource electricity product that was verified
25 through the Green-E process. It had to have the

1 Green-E stamp on it.

2 And by having that standard product they
3 could run a regular bid process, take the winner
4 of that, and it was a process that worked quite
5 well. And I think to the advantage of all
6 involved.

7 MR. HINKLE: I'd like to just add
8 something here. You know, maybe the word goal is
9 a better way to look at this. And I have a lot
10 less issue with goal as opposed to standard.

11 So if we remove that loaded term, it
12 would be really helpful to have more guidance. I
13 go to my management, I'd like to be able to tell
14 them, this is what the State of California expects
15 us to be able to do if we're really working at it.
16 This is what the average company does, this is
17 what the company in the top 10 percent does, you
18 know, for our industry.

19 And every industry will be different.
20 I'm a lot more comfortable with that, as opposed
21 to coming up with something that says, you will do
22 this by this time, you know, something like that.

23 The other issue, and this is kind of
24 along with incentives, is you brought up this
25 refrigerator thing. It's very intriguing. And

1 you showed how much savings we had in that.

2 But I believe about five years ago, or
3 maybe three years ago there was a competition for
4 energy efficiency refrigerator, they paid like a
5 million dollar prize or something like that?

6 MR. ROSENFELD: Yeah, the so-called
7 golden carrot.

8 MR. HINKLE: Yeah, the so-called golden
9 carrot. I think that that is a place that the
10 Energy Commission, if they could find the funding,
11 or maybe do some point partnering, I'll tell you,
12 a few million dollar prizes for areas that need
13 help might incentivize companies to really put the
14 R&D effort, as opposed to, and I just think this
15 tax thing is interesting, but having a prize
16 captures the public's imagination, too.

17 There was a lot of press on that. It
18 got them thinking about it. And so I think this
19 refrigerator thing, it's not just the standard.
20 There's a lot of things that have converged to
21 make the refrigerator efficiencies push down, I
22 believe. I may be wrong on that, but --

23 MR. ROSENFELD: Actually that golden
24 carrot has -- at least twice. One was for public
25 housing size -- Eric may remember the numbers, but

1 New York decided to offer, again, a fairly large
2 amount of money for refrigerators that were
3 appropriate size for public housing.

4 I think somebody came up with 30,000
5 sales in New York. And then Illinois bought
6 another 50,000. And that worked quite well. And,
7 again, is something that individual states could
8 pair up on.

9 I don't know why it was New York that
10 took the initiative that time, but it was an
11 interesting idea.

12 MR. HEALY: Dave, did you want to speak?
13 We're going to wind this up here pretty soon.
14 We've got one more panel, so --

15 MR. OLSEN: My name is Dave Olsen. I
16 represent a group of CEOs who have been lobbying
17 Congress for baseline protection. And I wanted to
18 speak particularly to this issue, Mr. Chairman,
19 since you raised it.

20 I think that providing some kind of way
21 to register companies' baseline emissions so that
22 the emissions reductions can be tracked would be
23 one of the most effective things that the state
24 could do, especially in the absence of any action
25 by the federal government, which is very unlikely,

1 at least for the next year and a half or so.

2 And really, for every company
3 represented here on this panel, are companies
4 which are already doing a lot to reduce their
5 emissions and improve their efficiency, there are
6 many other companies that we have found through
7 our recruitment efforts, to try to build a unified
8 business voice in support of policy to reduce
9 emissions and provide baseline protection.

10 There are many other companies that are
11 not feeling free to act aggressively to reduce
12 their emissions because they are afraid of being
13 penalized.

14 So that if -- so that if they do reduce
15 their emissions and there is some future
16 regulatory obligation they will be essentially
17 penalized the same way that companies that moved
18 early on sulfur caps were penalized.

19 So some kind of way to register
20 emissions baselines and provide that kind of
21 protection will be great encouragement to
22 companies. And the more companies that we can
23 then bring in to talk about the way that they are
24 reducing emissions, that's the best public
25 education I think that we can have.

1 MS. BAYER: If I could also speak to the
2 baseline issue. For me that's the cornerstone of
3 anything you do on greenhouse gas emissions.

4 If you look at the Kyoto protocol model,
5 what was the first thing that 160 governments did,
6 but to create national inventories. And to create
7 a protocol and a set of procedures for doing that
8 in a consistent, comparable way.

9 And the question earlier about what I
10 would suggest for public education, I think the
11 public education effort is really designed to
12 provide a tool to help companies who want to know,
13 where do I start. I get this question all the
14 time: Where do I start?

15 And the most basic thing that any
16 company can do, whether they're going to put
17 together a program to reduce their emissions or
18 not, is to identify where they are today.

19 We have somebody in our company who said
20 when you turn on the light you find a lot of
21 cockroaches. Well, you know, by just shining the
22 light you find the opportunities.

23 And for companies who thought they had
24 no opportunities, who thought this was not an
25 issue that affected them, when they conducted a

1 baseline, even on the back of an envelope, all of
2 a sudden, voila, they found opportunities.

3 So I think the most constructive thing
4 governments can do is to facilitate small, medium
5 and even large sized business in emphasizing the
6 constructive nature of just conducting a baseline
7 in a methodical sort of way.

8 Now, this WRIWBCSD initiative is
9 designed to do exactly that. UTC is a participant
10 in that effort. We're looking for companies, and
11 we're looking for NGOs that will help us peer
12 review this product once it's completed.

13 And I think there may be a role here for
14 the State of California with some of your contacts
15 with some of the industries here in the state, to
16 be effectively involved in that process, to make
17 sure it makes sense, to provide a sanity check for
18 small and medium sized businesses, as well as
19 large sized companies.

20 MR. HEALY: I think a lot of us agree
21 with you, Judith. That's a good point.

22 So I think we're going to have to move
23 on.

24 MS. DELLER: Thank you very much. Very
25 interesting.

1 Our last panel will be the public/
2 private partnerships. And Sally Ericsson has
3 agreed to moderate this panel.

4 And, we're going to plan a half hour, if
5 you need a little bit more, that's fine.

6 MS. ERICSSON: Thank you. I think we'll
7 address both these questions simultaneously like
8 the other two panels. I think that's efficient.

9 Before we begin I'd like to give my two
10 cents, some observations from today.

11 Just the wide variety of companies here,
12 and the number of sectors represented, and the
13 variety of actions that people are, activities
14 people are involved in makes it clear that as the
15 state thinks about where to go in a process sense,
16 that you have to have a stakeholder process to
17 build a broad-based consensus that touches lots of
18 different sectors.

19 And you may want to think about working
20 with other agencies so it's not just an Energy
21 Commission focused process, because there's other
22 air issues, as well. The more integration and
23 discussion of cobenefits and stuff, I think,
24 there's some opportunities here that -- and
25 challenges that we should look at.

1 And we need to expand the number of
2 firms involved in this process. And that's a role
3 that the state can play, as a role that lots of
4 our organizations can play. And I think also that
5 business can play.

6 Because we're going to the same
7 companies over and over again to talk about what
8 they're doing and their accomplishments. And I
9 think that's important, but we need to get the
10 word out and to bring people along.

11 Going through a baseline exercise like
12 Judith was just talking about is important -- as
13 people begin to think about the questions for
14 their own businesses, it brings them into the
15 fold. So I think if you do real hands-on sorts of
16 discussions you can bring people into the process,
17 because people are interested and they think that
18 eventually they'll have to deal with this issue,
19 they just don't know when or why.

20 And as far as what the state can do on
21 policy, I put a public policy hat on and think
22 about what the principles are, and I think it's
23 clear just listening to the discussions today, the
24 more flexibility you can build into, you know,
25 your approaches, the more market-based.

1 Because we're at a stage in the policy
2 development process where this is all very new.
3 And we need to encourage experimentation and
4 encourage innovation. It's just not mature yet.

5 And the consensus building process will
6 educate people, sort of bring people and business
7 along, but we just don't know the answers yet.
8 And we need to continue to work on what the
9 answers are.

10 Mike had to leave, unfortunately. He
11 told me three things to say -- Oregon Climate
12 Trust. He sees, after being here today, that this
13 is a case where business is ahead of policy
14 officials and lots of the environmental groups,
15 which is an interesting world for business to be
16 in.

17 And we need to -- so that's why baseline
18 protection is very important here, because the
19 early adopters need to be protected and encouraged
20 to continue to do what they're doing.

21 Businesses who are at this table and in
22 this room have the opportunity to be environmental
23 leaders here, not just in their normal situation
24 of being behind the carbon, dragged along. And we
25 need to figure out ways to continue to encourage

1 that.

2 Mike also made the point that public
3 education is crucial here. We're still not in a
4 stage where people understand the issue. And I
5 think that's basically it for what Mike had to
6 say.

7 I would encourage the state to look at
8 alternative mechanisms like the climate trust, as
9 ways to sort of deal with this issue in a way
10 that's not standard operating procedure from other
11 states.

12 So, our panel is at the end of the
13 table. I would like to start, I think, with Eric,
14 and address both of these questions.

15 MR. HEITZ: Well, with liberal editing
16 and some creativity, let me summarize today. No,
17 I'm just kidding.

18 First of all, it's pretty clear that
19 California should stay on course. Some of the
20 policies that we have in place we're already on a
21 trajectory, as Art pointed out with his numbers,
22 and some of my numbers pointed out, more than any
23 other state. We're on a trajectory to be at Kyoto
24 or around Kyoto. We should stay on course.

25 And that means sticking to some things

1 we've done well. Title 24, the public benefits
2 charge, I would argue, the ZEV regulations.

3 But then let me toss out five ideas,
4 which I think are even more specific than what
5 California could do, but they're what the
6 California Energy Commission might be able to do,
7 or might be able to champion.

8 Number one, champion, California should
9 be the first state to come up with a model bill
10 for early registry for carbon. It's simple, it's
11 not going to happen at the federal level. And
12 there is enough wherewithal if California did it,
13 that other states would do it. And I guarantee
14 you that once a certain number of states have done
15 it, that takes away no one's doing it at the
16 federal level.

17 That's exactly what happened with the
18 appliance standards. They were pioneered in
19 California, refrigerators in particular, and now
20 look where they ended up. So that's -- all over
21 the world-- that's number one.

22 And I can tell you from looking at
23 China, for example, that the fact that that
24 standard exists in the U.S. is going to save on
25 the order of two or three times the number of

1 power plants it saved here.

2 Number two. It seems perfectly in order
3 with what the California Energy Commission has
4 done in the past, that you ought to begin
5 developing carbon offset cost curves. And this is
6 something that Art pioneered in the early days of
7 energy efficiency.

8 It's a simple tool that looks across all
9 the possibilities and says, here's the cost of
10 various different approaches to reducing carbon.
11 We've done this with energy. Why not do it with
12 carbon.

13 It's going to be close proximity, but
14 there's going to be particular areas, we've heard
15 some today, where the cost to reduce carbon or
16 carbon equivalents were very very low, and often
17 positive.

18 That then should lead into, I would
19 argue, business-by-business benchmarking, which is
20 what someone called for earlier on the panel,
21 where it would be perfectly appropriate for the
22 Energy Commission to begin to break out the
23 industrial sectors, the different sectors, and
24 say, here's what the top 10 percent, the top 1
25 percent, the bottom 20 percent does. And then

1 begin to ask the question, how are you doing with
2 respect to this.

3 Finally, then getting perhaps a little
4 more away from starting from the center, which
5 Judith urged us to do, I would argue that the CEC
6 could easily and justifiably, based on their
7 economic benefits, argue for business investment
8 tax credits for certain technologies.

9 At the top of our list would be fuel
10 cells and microturbines in cogen configurations,
11 together with renewables. But everyone can have
12 their list, that's a debate we should all have.

13 But there are some very clean ones, and
14 those -- we should offer incentives for those
15 businesses who are willing to do it.

16 Finally, a fee-bate program which would
17 reward clean and low carbon cars. We've got to
18 reward them both. But -- correct, benign cars.
19 And that would be our five point recommendations.

20 MS. ERICSSON: Art, any comments?

21 MR. ROSENFELD: No, the trouble is
22 that --

23 (Laughter.)

24 MR. ROSENFELD: Eric and I agree on all
25 these things. I'm actually going to just tell you

1 one story about China just because the standards
2 business is so magnificent there.

3 You've all heard of the Three Gorges
4 Dam. It's the world's largest, most
5 controversial, maybe most awful construction
6 project. It's going to be completed -- it's going
7 to be full and completed, I think, fully, it's 18
8 gigawatts, in 2016.

9 Now, unless China changes its standards
10 on -- luckily, it will, Eric, this is a memorial
11 picture -- if China were not to change its
12 standards on refrigerators, plus air conditioners.

13 China now sells 9 million refrigerators
14 a year, and 9 million home air conditioners a
15 year. Those silly things will use up the Three
16 Gorges Dam.

17 Decent standards will save half of the
18 Three Gorges Dam for true economic development.
19 That's how powerful standards are.

20 But otherwise all I really want to do is
21 use any little clout I have to say I think Eric's
22 five are exactly -- Eric's five are my five.

23 (Pause.)

24 MR. BEEBE: That's what we lack in the
25 energy industry, is feedback.

1 (Laughter.)

2 MR. BEEBE: The answer must be in
3 electronics.

4 MR. ROSENFELD: I'm sorry, I had one
5 phrase which I got distracted from. When it
6 comes to fee-bates, and Eric sort of suggested
7 this, the only new wrinkle I think we thought of
8 in fee-bates in the last ten years is focus them
9 on emerging technologies. You can afford to give
10 very large incentives to things which have only 2
11 percent market share, it's not going to wreck the
12 state. And it will advance technologies
13 considerably.

14 MS. ERICSSON: Jim.

15 DR. CATHCART: Okay, I'm going to start
16 with question number two real briefly, and by the
17 California State Government, I'm taking it that we
18 mean the Commission and staff, supporting staff
19 agencies.

20 I think what I can say with respect to
21 two is not to overlook the role of sink
22 enhancement opportunities, and I think the
23 Commission is in a unique position to talk with
24 the other natural resource agencies like the
25 Department of Forestry, Department of Fish and

1 Wildlife, Department of Water Resources, and see
2 what's on their problem list in terms of where we
3 need to look for innovative environmental
4 solutions.

5 And then you are in a position now to
6 link those problems and solutions to this business
7 community that is looking to offset emissions or
8 other environmental performance standards.

9 And I'll just kind of go through some
10 examples. When you lose a subdivision in
11 California to fire, that's a tragic emission
12 event. And fuels reduction treatment programs are
13 reducing that risk.

14 I'm not sure where you're at with roofs,
15 but if you still have houses with cedar shake
16 roofs, replacing those roofs on existing houses is
17 something to do. And probably people don't have
18 the money to do it.

19 But, also looking probably to the real
20 issue in those areas, is expanding development in
21 the forest/urban interface. And what kind of
22 programs can be innovative to reduce fire
23 reduction risk, smart development.

24 Well, all those are going to avoid
25 tragic carbon emission events.

1 Habitat protections on agricultural
2 lands. We need sinks, we need sinks around
3 streams, we need sinks around wetlands. Again,
4 think of those issues in terms of your problems.

5 You have an excellent nonprofit, I'll
6 just put in a plug, in Bloomfield, California
7 called the Pacific Forest Trust. Looking for
8 capital to fund conservation easements to protect
9 forest habitats; to keep trees on site for habitat
10 benefits and carbon storage.

11 And then under-producing lands, the
12 program I talked to you about today, where these
13 are areas that we can bring into forest
14 production. And those can be areas of future
15 timber supply for the state.

16 With respect to question number one, I
17 think I just want to -- I don't know if you're
18 familiar with it, but if you're not, I suggest you
19 become familiar with it. And that's the Western
20 Governors Associations Enlibra principles. We've
21 been kind of circling around a lot of what would
22 make a desired policy environment. And the
23 Enlibra principles were not gen'd up by the
24 western governors as this is the right framework
25 for policy.

1 A clear distinction is that they're the
2 opposite. They are what the governors observed as
3 working in policy developments. So they're kind
4 of making a generalization of looking at different
5 solution oriented type processes and results, and
6 then saying, what is the common denominator here.
7 And that's where the Enlibra principles came. And
8 I think they make an excellent, excellent tool for
9 seeing what steps you're taking in question one
10 are hitting all the cylinders.

11 And I'm just going to go over them, just
12 by title -- don't get anybody worried -- the eight
13 principles. And they'll either resonate with you
14 or they won't.

15 National standards, neighborhood
16 solutions. Okay, that's the one size does not fit
17 all type issue.

18 Collaboration, not polarization. The
19 third one is change a heart, change a nation. And
20 that's one company at a time, one business at a
21 time, onetree at a time.

22 Reward results not programs. Okay.
23 Science for facts, process for priorities.
24 Markets before mandates. Recognition of benefits
25 and costs, we always have to look at efficiency.

1 And the last one is that solutions transcend
2 political boundaries.

3 And I think again you can find these at
4 the Western Governors Association website, which
5 is www.westgov.org. And just for the record, it
6 is policy resolution 99-013. Okay.

7 MS. ERICSSON: Are there any questions
8 from the audience as we wind things down this
9 afternoon? Yes, questions from the panel, I'm
10 sorry, Bud.

11 MR. BEEBE: Yes, just two thoughts.
12 One, should California allow JI; should we allow
13 joint implementation, say somebody uses something
14 here and it shuts down a coal plant in Nevada.

15 It's a practical question and we really
16 need to deal with it.

17 The other one is how the hell do you
18 deal with baseline growth. Everybody wants to
19 say, well, I don't mind keeping my CO2 emissions
20 low relative to my growth, but if it's going to
21 keep me from growing, well, I can't do that.

22 And both of those points, JI and the
23 question of how do you reconcile growth, or
24 shrinkage, with CO2 commitments. Those two things
25 have really been the sticking things as we have

1 tried to put together, I think, some pretty decent
2 collaborations on the national level. And
3 California will have those same problems.

4 MS. ERICSSON: I think the state
5 should -- I mean, Judith is right, we should plug
6 into what's happening with this WRI discussion
7 which is addressing, and how these definitional
8 issues and how you deal with growth and how you
9 deal with acquisitions and divestitures. I mean
10 it's all these, and every company has a different
11 set of questions but they're all -- it's a big
12 one, that's right.

13 The JI question, I don't have any
14 insight on it.

15 MR. ROSENFELD: This is a very small
16 comment compared to the huge and wonderful issues
17 we've been discussing, but I just wanted to make a
18 remark. Oregon doesn't have any big cities with
19 heat islands and smog problems. So you wouldn't
20 have thought about this particularly.

21 But, you don't have Los Angeles, okay.
22 However, I just want to remind us as a matter of
23 state policy that if California does, and should,
24 give credit for tree planting, then there is this
25 little vignette that Los Angeles is a heat island

1 which is growing 1 degree Fahrenheit every eight
2 years, much faster than global warming.

3 Because basically asphalt is cheap, so
4 we put down asphalt roads and dark-colored roofs.
5 And we cut down trees.

6 The arithmetic is such that if you plant
7 a tree shading a west window in L.A. then you
8 don't have to run electricity for air
9 conditioning, and you save the equivalent of nine
10 trees worth of carbon.

11 If, in addition, you require white roofs
12 on flat roofs where you can't see them, and then
13 no architect is upset, you save another nine trees
14 worth of carbon per 1000 square feet.

15 I would be a little bit upset if
16 California forgets that there is that wonderful
17 mine of carbon saving in the City of Los Angeles.

18 This ignores the fact that the real
19 reason for doing it is to save much more than that
20 in the way of ozone. But while we're at it, we
21 might as well reward the carbon savings. So I'd
22 like to keep that on the agenda.

23 MS. ERICSSON: I'm going to Chicago next
24 week where they're doing a lot of this work on
25 heat islands and tree planting on roofs. They're

1 just beginning this process.

2 Any other questions from the panel?

3 Comments? The audience? Bob.

4 MR. WILKINSON: Thanks, Bob Wilkinson,
5 I'm with the University of California Santa
6 Barbara, working on the impacts assessment for
7 California for the U.S. assessment on climate
8 impacts.

9 I want to follow on Art's comment and
10 it's a -- as to the state's role and following on
11 your point, I think we really need to work harder
12 at quantifying the multiple benefits that accrue
13 from various strategies, whether they are to
14 mitigate air quality issues absent the climate
15 concern, or whether they're climate oriented.

16 The work that many of you have just
17 talked about in saving water, for example, some
18 significant water savings, water is very energy
19 intensive in California, particularly depending on
20 where you're located. That means there are major
21 benefits that are accruing that you may or may not
22 be accounting for and taking advantage of.

23 If there's public benefit to that, and a
24 state could accurately quantify the public benefit
25 from the actions you are taking, that would give

1 us information to calibrate incentives. So that
2 would help us justify and calibrate appropriate
3 incentives. And on the other side of it,
4 disincentives, if that's the game or regulations.
5 But to focus on the incentives would be quite
6 helpful.

7 So I propose we work at that. I also
8 want to compliment, to really answer this question
9 of what the Energy Commission and the Resources
10 Agency has done here today, I think this is really
11 valuable. This is the education of all. So I
12 applaud Bill Keese, Jim Boyd and Mary Nichols, and
13 I think we should -- the comments from, I guess
14 from Oregon, are really apt.

15 The benefits in watershed management,
16 for example, are very important. So for forestry
17 and water and the other agencies, other resources
18 to understand the implications of both the
19 solutions as well as the problem, and their role
20 in being part of the solution is quite helpful.

21 MS. LEINING: Hi, I'm Catherine Leining
22 with the Center for Clean Air Policy. We're a
23 nonprofit in Washington, D.C. And we've done a
24 lot of work on multiple benefits of clean air and
25 climate change. And we're also looking at revenue

1 recycling options for climate change.

2 I just had a couple comments. The first
3 is on baseline protection. And if California is
4 interested in looking at different approaches,
5 they could start looking at what New Hampshire and
6 New Jersey are doing here.

7 New Hampshire has already passed
8 legislation on baseline protection. It's pretty
9 skeletal. It's kind of more of a placeholder.
10 There are lots of important questions that need to
11 be answered. But at least the politics of what
12 language went into it, and what the process was
13 for passing it, could be very insightful.

14 The second point I wanted to make is
15 about public/private partnerships, and this idea
16 of financial incentives. I think it's real
17 important for the state to think about how taxes,
18 tax credits, rebates, can be recycled to create
19 systems that work.

20 One of the problems with the CAFE
21 standards is that the population's going up, and
22 everyone's still driving. And it would be nice if
23 we could think about not only how do you reward
24 drivers who don't buy an SUV and instead choose a
25 super ultra low emission vehicle, but how do you

1 convince them to leave that at home during the
2 week and take public transportation to work.

3 And it would be really nice to see if
4 there are ways that we can create a comprehensive
5 system that works.

6 MS. ERICSSON: Any other comments? Yes.

7 MR. BOYD: Thank you, Sally. I hadn't
8 intended to say anything more. I came here, as I
9 said this morning, to learn and to listen. And
10 along that vein I want to thank all the panel
11 members.

12 I'm sure Bill probably has concluding
13 remarks and I don't mean to give concluding
14 remarks, but thank you all for your participation,
15 because frankly I have learned a lot.

16 But I wouldn't want you to go home
17 tonight thinking that the State of California
18 doesn't know a lot of what's going on out there,
19 and just let me skip across the surface a little
20 bit on some of the issues.

21 I was, as I said I came here to learn
22 and listen and bit my tongue when my good friend,
23 Dave Hermance, talked about standards and the ZEV
24 program, which I feel like one of the authors of,
25 but we just disagree, let's leave it at that, on

1 whether there'd be his car today without some of
2 those things. But so be it.

3 I want to assure you that the early
4 reference to thanking the Air Resources Board for
5 their involvement in this, albeit somewhat quiet,
6 was to try to point out that there is a
7 recognition of the integration or the need for
8 multiple agencies to work together on these
9 issues.

10 I'm sure, sprinkled through the audience
11 today, have been representatives of the Department
12 of Forestry, perhaps Fish and Game, Water
13 Resources, et cetera, because as Bill knows, we
14 have talked this issue up a lot within the agency.

15 Another pet project of mine that does
16 tie into this is the issue of biomass. And a lot
17 of people think of that narrowly as biomass to
18 electricity. Lately the rage is biomass for
19 ethanol vis-a-vis MTBE. Those are all horses we
20 can put in the team to drive the issue of biomass.
21 But biomass is so much bigger than that, and we
22 are trying to get all the people together, the
23 Forestry people, the forest health issues, the
24 forest fire issues, the rural economic development
25 issues, the use of the products for other things,

1 the rice stubble, the ag burning issues, et
2 cetera, et cetera, into a solution to biomass.
3 And do recognize that there's a relationship with
4 global climate in this issue, as well.

5 I think a key thing we have to do is
6 bring as many of these issues under the various
7 tents there are, or the fewer tents, the better,
8 to try to get multiple programs, issues and
9 agencies involved in the solutions.

10 And I came here as a very strong
11 advocate of public/private partnerships.
12 Something I learned in my 20 years in the air
13 quality business. I must confess, early on, it's
14 the last thing one would have ever thought of as a
15 regulator, but I did a turnaround. I may be old
16 in age, but I like to think I'm young in receptive
17 to ideas. And became a strong advocate, as many
18 of my peers did, of the validity and value of
19 those kinds of approaches.

20 As we progress along the ever-
21 accelerating pace of knowledge participation and
22 what-have-you, that's the way we go. Incentives,
23 volunteerism, all of those eventually hopefully
24 will supplant most of the traditional old command
25 and control. Not that some forms of prodding

1 don't help in some areas. But, we need to
2 recognize the world changes on a daily basis.

3 Bill Keese and I participated with the
4 governors in a big conference on Enlibra a couple
5 of years ago, I guess. And I guess I've been
6 working ten years with the Western Governors
7 Association on regional issues.

8 So we are plugged in. It takes huge
9 networks like that, but the big thing is your
10 participation in these issues, the big thing is
11 the partnering, the big thing is finding some
12 common ground in the center that we can agree
13 with.

14 And I do want to also talk about the
15 baseline. I mean as one who's been associated
16 with emissions trading programs and the air
17 quality arena, I know they live or die by the
18 validity of the baseline. That has to be
19 established, because how can you add pluses or
20 minus if you don't have faith in baseline.

21 And believe me, in some of the early
22 programs people argued like crazy. There were
23 arbitrary discounts because of the disbelief.

24 So all the talk here about establishing
25 baselines and getting a mutual agreement on a

1 baseline and working with those who are already
2 launched into this area is something we definitely
3 want to take into account and work with you all
4 on. And it is an excellent point.

5 So, I just wanted to indicate how
6 grateful we are for your participation. I trust
7 you're there for us in the future, as we want to
8 work more on these issues because you are the
9 outstanding companies. You were willing to come
10 here today. There are a lot of partnering issues
11 and questions just how to launch this that we're
12 going to want to deal with you on. And frankly,
13 we'll probably have to increase the size of the
14 tent, maybe the room and the audience, in the
15 future, as we do try to bring in many issues.

16 Because you have to deal with things, I
17 think somebody else made reference to the system,
18 we've got to deal with the whole system. We can't
19 deal with some of these things just in isolation.

20 So I'm glad my pager didn't go off and
21 drag me away today, as it often does. And I got
22 to take advantage of all this. And I look forward
23 to working with all of you in the future on this.
24 Some excellent ideas today.

25 MS. ERICSSON: I think with that we are

1 done.

2 MS. DELLER: Well, I want to thank
3 everybody, and I think Bill Keese probably wants
4 to, too. I feel like we've gone through a forced
5 march today, but your enthusiasm and commitment to
6 this issue are very obvious and very much
7 appreciated.

8 So, thank you.

9 (Applause.)

10 MS. DELLER: I'd also like to thank Nan
11 Powers and Cindy Wren for the work they did
12 putting this together.

13 (Applause.)

14 CHAIRMAN KEESE: Thanks, Nancy, and
15 thanks particularly to our staff who have not --
16 while they've not asked the questions, I'm sure
17 they've been paying very close attention to all
18 the responses here.

19 You know, I have a way of keeping this
20 going, but you've been so dedicated, and we've
21 been able to get so much into one day, I
22 appreciate it.

23 I would just ask Mr. Boyd, knowing that
24 the devil's in the details, what year did he want
25 to set the baseline at.

1 (Laughter.)

2 CHAIRMAN KEESE: Let's forget that we
3 even talked about that, because then we wouldn't
4 end till morning, I'm sure.

5 I'll just say thank you to everybody.
6 Really appreciate your endurance, and the
7 endurance of our audience that stuck with us.
8 Thanks.

9 (Applause.)

10 (Whereupon, at 5:20 p.m., the workshop
11 was concluded.)

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